Dulles Corridor Metrorail Project
198 Van Buren Street, Suite 300
Herndon, VA 20170

METROPOLITAN
WASHINGTON
AIRPORTS AUTHORITY

December 17, 2018

Ms. Terry Garcia Crews
Regional Administrator
Federal Transit Administration, Region III
1760 Market Street, Suite 500
Philadelphia, PA 19103

Subject: Dulles Corridor Metrorail Project – Extension to Wiehle Avenue
Before and After Study, Task 5 Comparative Analysis

Letter No: MWAA-10701

Dear Ms. Crews:

The Metropolitan Washington Airports Authority (Airports Authority) is pleased to submit the attached report of the *Task 5 Technical Memorandum, Comparative Analysis* as part of the Before and After Study Plan program for the Dulles Corridor Metrorail Project – Extension to Wiehle Avenue (Project).

The Airports Authority, as the lead agency implementing the Project, is responsible for the development and execution of the Before and After Study Plan (Plan) for Phase 1 as required by Congress for all New Starts projects. As outlined in the Plan approved by the Federal Transit Administration (FTA) in 2008, the Airports Authority completed Tasks 1 and 2 of the Plan in 2009, which included the organization, work plan and schedule for implementing the various tasks contained in the Plan, as well as the documentation of project planning and budget forecasts assembled prior to the award of the Full Funding Grant Agreement for Phase 1 in 2009. The Airports Authority subsequently completed the final versions of the *Task 3 Technical Memorandum, Documentation of Conditions Before Project Opening* in 2015, and the *Task 4 Technical Memorandum, Documentation of Conditions After Project Opening* in 2017.

This technical memorandum provides information to satisfy the Airports Authority's requirement to complete Task 5 "Comparative Analysis," based on documented conditions compiled following two years after the Washington Metropolitan Area Transit Authority (WMATA) commenced Phase 1 revenue operations, which occurred on July 26, 2014. This time period following revenue operations was utilized to allow the compilation of as-built/as-operated conditions. The current document now provides a comparative analysis of actual conditions against the project planning forecasts for the following project elements:

- Physical Scope of Project
- Capital Cost of the Project
- Transit Service and Fare Policy

RECEIVED/SCANNED
DEC 20 2018
MWAA / PMSS
DOCUMENT CONTROL

- Operations and Maintenance Costs
- Ridership

This document is intended to provide a comparative analysis of the documented After (actual) conditions against forecasts and projections prepared and submitted to FTA at the following New Starts project milestones:

- Entry to Preliminary Engineering (PE)
- Entry to Final Design (FD)
- At Full Funding Grant Agreement (FFGA)

Please note that this report is being submitted at this time in draft form to get general agreement on the structure, format, and content for the Task 5 technical memorandum. Included is an appendix containing a significant amount of backing data and analysis, including tables detailing ridership and trip pattern analyses that were requested by FTA following several discussions and a workshop held earlier this year with the FTA Office of Planning. Additionally, spreadsheets for the analysis that were provided by FTA for use in the cost analysis have been populated with project data and can be provided electronically to FTA upon request.

This material will be included in the subsequent Completion and Documentation of the Analyses as the final record of the Project's Before and After Study.

If there are any questions or comments, please advise by February 1, 2019 in order for them to be incorporated into the final record of the Before and After Study. You may contact James Van Zee at james.vanzee@dullesmetro.com or at (703) 572-0504 with any questions or comments.

Sincerely,

Charles W. Stark, P.E.
Senior Vice President
Dulles Corridor Metrorail Project

CWS/pde/me

Attachments: as stated

cc: A. Anderson, FTA
J. Ryan, FTA
J. Rouxe, FTA
T. Crone
J. Van Zee
P. Elman

Dulles Corridor Metrorail Project – Extension to Wiehle Avenue (Phase 1) Before and After Study

Task 5 – Comparative Analysis for Before and After Study

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

IN COORDINATION WITH

THE WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY AND

THE FEDERAL TRANSIT ADMINISTRATION

DECEMBER 2018

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

DULLES CORRIDOR METRORAIL PROJECT

metro

FTA Federal Transit Administration

PHASE 1: EXTENSION TO WIEHLE AVENUE

CONTENTS

Contents 1
1 Introduction 5
1.1 Purpose of the Before and After Study 6
1.2 Calendar of Project Milestones 7
2 Physical scope of the Project 8
2.1 As-Built Physical Scope of the Project 9
2.2 Comparison of As-Built Physical Scope vs. Milestone Predictions 10
2.2.1 Accuracy of Predictions and Causes of Differences 12
2.3 Lessons Learned – Physical Scope 19
3 Capital Cost of the Project 20
3.1 Actual or As-Built Capital Cost of the Project 20
3.2 Comparison of Actual Capital Cost vs. Milestone Predictions 21
3.2.1 Accuracy of Predictions and Causes of Differences 21
3.3 Lessons Learned – Capital Cost 25
4 Transit Service and Fare Policies 30
4.1 Characteristic of As-Built or Actual Transit Service and Fare Policy 30
4.1.1 Metrorail 30
4.1.2 Other Transit Services 32
4.2 Comparison of As-Built Service Levels and Fare Policies vs. Predictions 34
4.2.1 Metrorail 34
4.2.2 Other Transit Services 35
4.2.3 Accuracy of Predictions and Causes of Differences 39
4.3 Lessons Learned 40
5 Operations and Maintenance (O&M) Cost 40
5.1 As-Built O&M Costs for the Project 40
5.1.1 Metrorail 40
5.1.2 Other Transit Services 41
5.2 Comparison of As-Built O&M Cost vs. Prediction 41
5.2.1 Accuracy of Predictions and Causes of Differences 42
5.3 Lessons Learned 43
6 Ridership 43

6.1 As-Built Ridership of the Project 45
6.2 Comparison of As-Built Ridership vs. Prediction 47
6.2.1 Ridership "Headwinds" 47
6.2.2 Changes in Ridership Patterns 48
6.2.3 Accuracy of Predictions and Causes of Differences 67
6.3 Lessons Learned 70

Glossary of Terms and Acronym

AAWDT	Average Annual Weekday Daily Traffic
ATO	Automatic Train Operation
ATP	Automatic Train Protection
ATS	Automatic Train System
CNPA	Concurrent Non-Project Activities
DEIS	Draft Environmental Impact Study
DTMP	Dulles Transportation Management Plan
EFC	East Falls Church
FEIS	Final Environmental Impact Study
FFGA	Full Funding Granting Agreement
FTA	Federal Transit Administration
GIS	Geographic Information System
LOS	Level of Service
MWAA	Metropolitan Washington Airports Authority
NTD	National Transit Database
PE	Preliminary Engineering
Project	Dulles Corridor Metrorail Project - Extension to Wiehle Avenue (Phase 1)
ROD	Record of Decision
SCC	Standard Cost Categories
SmarTrip	Electronic stored-valued smart card payment system maintained by WMATA
TAZ	Traffic Analysis Zone
TBS	Tie Breaker Station
TPSS	Traction Power Substation
Tripper Trains	Peak hour, peak direction trains to supplement the ridership capacity of regularly scheduled trains
VDOT	Virginia Department of Transportation
VRE	Virginia Railway Express
WFC	West Falls Church

WMATA	Washington Metropolitan Area Transit Authority
YOE	Year of Expenditure

1 INTRODUCTION

The Dulles Corridor Metrorail Project - Extension to Wiehle Avenue (Phase 1) (the Project) is the latest 11.7-mile extension of the Washington Metropolitan Area Transit Authority (WMATA) 106-mile Metrorail system into the Dulles corridor in northern Virginia within the greater Washington, D.C. metropolitan area (**Figure 1-1**). It extends from the Metrorail Orange Line just east of the West Falls Church (WFC) Station to the Wiehle-Reston East Station located on Wiehle Avenue in Reston, providing direct rail service to Tysons Corner. This segment comprises the first of the two phases of the Silver Line extension that will ultimately extend the Metrorail system beyond the Dulles International Airport to Route 772 in eastern Loudoun County, completing the total 23.1-mile extension. This report addresses the Phase 1 extension, which currently operates service of the Silver Line between Wiehle-Reston East Station and Largo Station (in Maryland) through Washington, D.C. The Metrorail service map with the addition of the Silver Line service is shown in **Figure 1-2**.

Figure 1-1: Study Area

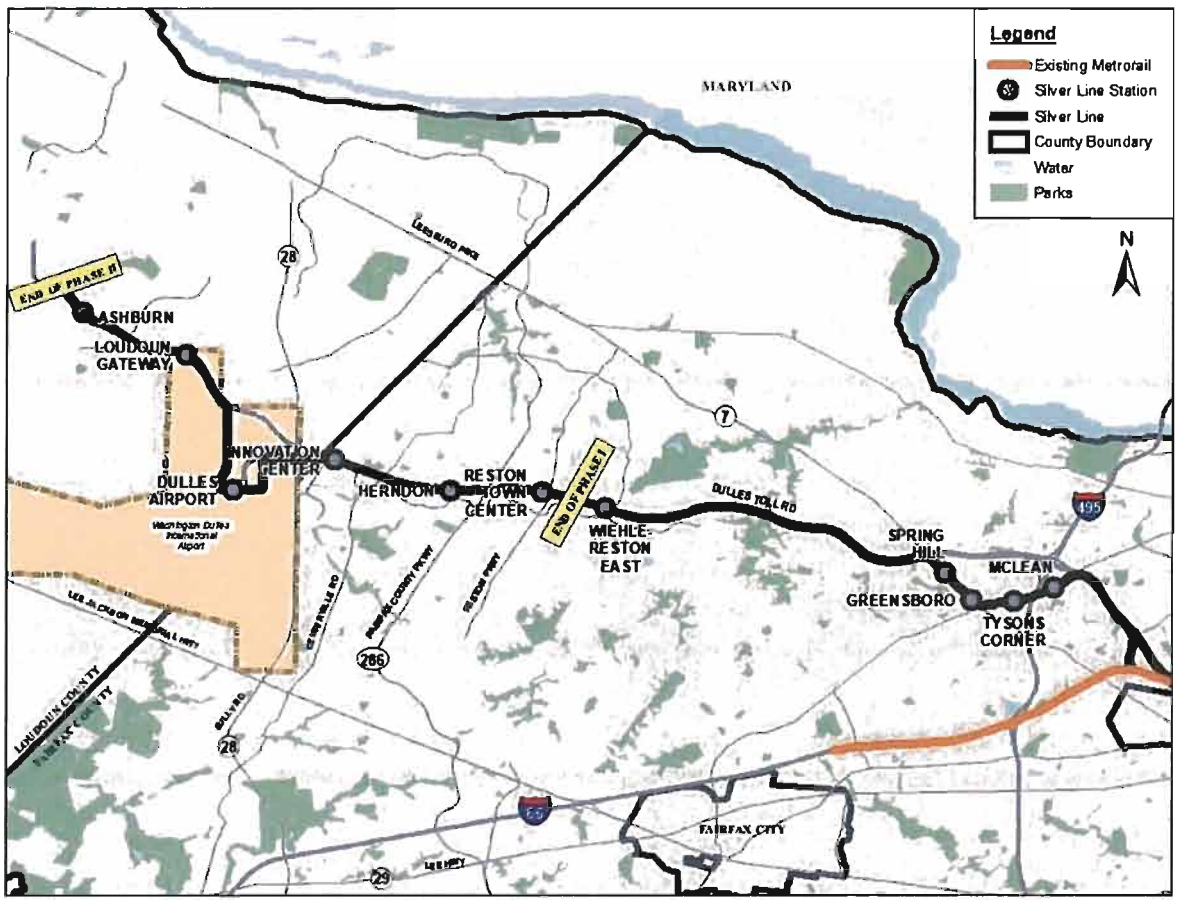
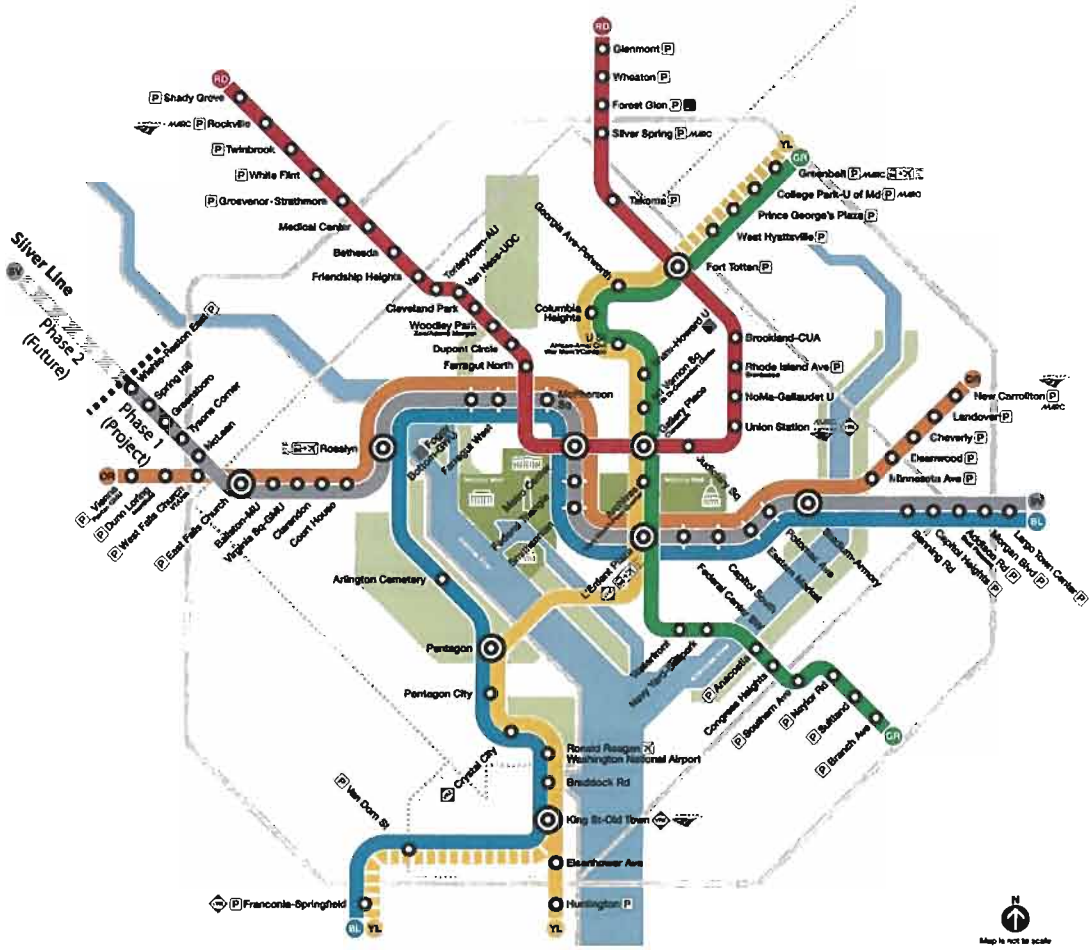


Figure 1-2: WMATA Metrorail Service Map (with the Project)



Source: WMATA, 2014

1.1 Purpose of the Before and After Study

The Project is a recipient of federal funds through the Section 5309 Fixed Guideway Capital Investment Grants (New Starts) program. The Project is funded through a Full Funding Grant Agreement (FFGA) with the Federal Transit Administration (FTA). As the FTA New Starts grantee, the Metropolitan Washington Airports Authority (MWAA) is the lead agency responsible for the Project.

The FFGA [Section 5309(k)(2)(E)] requires the completion of a Before and After Study, which requires:

- Description and analysis of the impacts of the project on public transportation services and ridership;
- Evaluation of the consistency of predicted and actual project characteristics and performance; and
- Explanation of differences between projections and outcomes.

The Before and After Study is segmented into five tasks that is completed over the course of the Project, and subsequent to the completion and opening of the Project. These tasks are outlined in **Table 1**.

Table 1: Before and After Scope of Work

Tasks	Date
Task 1: Prepare Work Plan	**August 2008**
Task 2: Documentation of Forecasts	**December 2008**
Task 3: Documentation of Conditions before Project Implementation	**May 2015**
Task 4: Documentation of Conditions after Project Implementation	**December 2016**
Task 5: Completion and Documentation of the Analyses	**Current Document**

The task numbers and content are in accordance with the approved Before and After Study Plan (August 2008). Subsequent changes in task numbers proposed by FTA for future Before and After Studies and their associated content have not been incorporated into the Project. This report satisfies Task 5, which documents and evaluates the before (Task 3) and after (Task 4) conditions by comparing projections developed during the different project development milestones and the actual project outcomes.

1.2 Calendar of Project Milestones

Table 2 provides a list of key project dates. The Project received approval to enter Preliminary Engineering in 2004 and the FFGA was signed in March 2009. The project initiated revenue operations on July 26, 2014.

Table 2: Project Timeline

Event	Date
Complete Major Investment Study	**1997**
Begin Environmental Process	**April 2000**
Release of Draft Environmental Impact Study (DEIS)	**June 2002**
Release of Supplemental DEIS	**October 2003**
Entry to Preliminary Engineering (PE) and Release of Final Environmental Impact Study (FEIS)	**December 2004**
Record of Decision (ROD) from FTA	**March 2005**
Receipt of Approval for Entry to Final Design (FD)	**May 2008**
Full Funding Grant Agreement (FFGA) Signed	**March 2009**
Start of Construction	**March 2009**
Start of Revenue Service	**July 2014**

The main objective of this report is to document the actual project outcomes and evaluate them against the predictions made during the project planning milestones as depicted in **Table 3.** The evaluation will summarize the accuracy of the predictions at different project planning milestones and identify themes or factors influencing major discrepancies.

Table 3: Project Planning Milestones and Dates of SCC Table Data

Milestone	Milestone Date	SCC Table Data Date
Entry to Preliminary Engineering (PE)	November 2004 (approved December 2004)	May 2004
Entry to Final Design (FD)	September 2007 (approved May 2008)	December 2007
Full Funding Grant Agreement (FFGA)	December 2008 (approved March 2009)	December 2008
Actual or As-Built	Start of Revenue Service: July 2014	March 2017

2 PHYSICAL SCOPE OF THE PROJECT

This section of the report describes the physical scope of the Project at its completion organized by elements described in the FFGA. It does not include additional elements that have been (or are proposed to be) implemented with funds outside of the FFGA such as the Concurrent Non-Project Activities (CNPAs). CNPAs include non-federal infrastructure improvements that are constructed concurrently with the Project but are considered outside the scope of work defined by the FFGA.

In addition to the list of the physical scope elements of the Project, this section compares and evaluates the accuracy of the predicted physical scope at each project development milestone against the actual outcome. The following sections contain a summary of the physical scope of the Project including the as-built (actual) and predicted physical scope of the Project, organized the FTA Standard Cost Categories (SCC) (see **Table 4**), the accuracy of the predictions, causes of differences, and possible lessons learned. Information on SCC 80-100 has not been included in the physical scope section as they do not represent actual physical scope items of the project.

Table 4: SCC Division

SCC Number	Description
10	Guideway and Track Elements
20	Stations, Stops, Terminals, Intermodal
30	Support Facilities: Yards, Shops, Administrative Buildings
40	Site Work and Special Conditions
50	Systems
60	Right-of-Way, Land, Existing Improvements
70	Vehicles
80	Professional Services
90	Unallocated Contingency
100	Finance Charges

2.1 As-Built Physical Scope of the Project

This section summarizes the physical scope of the Project at completion organized by SCC (**Table 5**).

Table 5: Summary of Actual Physical Scope of the Project

SCC Division	Units	As-Built (Actual)
10 – Guideway and Track Elements		
Overall Trackwork	Miles (Description)	**11.56 mi.** (Wiehle Avenue-Reston Extension between East Falls Church and Reston-measured from GIS)
Guideway: At-Grade Exclusive ROW, Built-up fill, or Retained Cut or Fill	Miles (Description)	**7.89 mi.** (West Falls Church/Tysons Corner segment and Wolf Trap/Reston segment- measured from GIS)
Guideway: Aerial Structure	Miles (Description)	**3.16 mi.** (West Falls Church entrance segment and Tysons Corner entrance to exit segment- measured from GIS)
Underground	Miles (Description)	**0.47 mi.** (Rt. 7/Rt. 123 intersection segment)
20 - Stations, Stops, Terminals, Intermodal[1]		
Stations	Number	5
At-Grade Platform	Number	2
Aerial Platform	Number	3
Underground Platform	Number	-
30 - Support Facilities: Yards, Shops, Administrative Buildings		
West Falls Church Yard	Description	Based on building code requirements of the Department of General Services, the AHJ for the WFC yard improvements, the cover box grew significantly in scope to become enclosed on all sides and classified as a building with fire suppression and protection and HVAC.
40 – Site Work and Special Conditions		
Demolition	Yes/No	Yes
Utilities	Document	Final Design Plans
Environmental Mitigation	Document	ROD Attachment A-Amended November 2006 and status updates for compliance
Roadway / Landscaping	Document	ROD Attachment A-Amended November 2006 and status updates for compliance
50 – Systems[2]		
Traction Power System	Number	14
TBS	Number	3
TPSS	Number	11
Communication Systems	Type	Rail Based
Train Control System	Type	ATP, ATO, ATS
60 - Right-of-Way, Land, Existing Improvements		
Quantity	Parcels	88
70 – Vehicles		
Heavy Rail Vehicles	Number	64
Peak Period Consist Size	Number	6 - 8
Off-Peak Period Consist Size	Number	4

2.2 Comparison of As-Built Physical Scope vs. Milestone Predictions

Table 6 summarizes and compares the physical scope of the Project at the different project milestones.

Table 6: Comparison of Actual vs. Milestone Predictions of Physical Scope of the Project

SCC Division	Units	Entry to PE	Entry to FD	FFGA	As-Built (Actual)
10 – Guideway and Track Elements					
Overall Trackwork	Miles (Description)	**11.60 mi.** (Wiehle Avenue-Reston Extension between East Falls Church [EFC] and Reston)	**11.91 mi.** (Wiehle Avenue-Reston Extension between EFC and Reston)	**11.68** mi. (Wiehle Avenue-Reston Extension between EFC and Reston)	**11.56 mi.** (Wiehle Avenue-Reston Extension between EFC and Reston-measured from GIS)
Guideway: At-Grade Exclusive ROW, Built-up fill, or Retained Cut or Fill	Miles (Description)	**7.5 mi.** (West Fall Church [WFC]/Tysons Corner segment and Wolf Trap/Reston segment)	**8.36 mi.** (WFC/Tysons Corner segment and Wolf Trap/Reston segment)	**8.06** mi. (WFC/Tysons Corner segment and Wolf Trap/Reston segment)	**7.89 mi.** (WFC/Tysons Corner segment and Wolf Trap/Reston segment- measured from GIS)
Guideway: Aerial Structure	Miles (Description)	**3.1 mi.** (WFC entrance segment and Tysons Corner entrance to exit segment)	**3.1** mi. (WFC entrance segment and Tysons Corner entrance to exit segment)	**3.16 mi.** (WFC entrance segment and Tysons Corner entrance to exit segment)	**3.16 mi.** (WFC entrance segment and Tysons Corner entrance to exit segment-measured from GIS)
Underground	Miles (Description)	**1.0 mi.** Rt. 7/Rt. 123 intersection segment	**0.45 mi.** Rt. 7/Rt. 123 intersection segment	**0.46 mi.** Rt. 7/Rt. 123 intersection segment	**0.47 mi.** Rt. 7/Rt. 123 intersection segment
20 - Stations, Stops, Terminals, Intermodal[1]					
Stations	Number	5	5	5	5
At-Grade Platform	Number	1	2	2	2
Aerial Platform	Number	3	3	3	3
Underground Platform	Number	1	-	-	-
30 - Support Facilities: Yards, Shops, Administrative Buildings					
West Falls Church (WFC)	Description	S&I Bldg. expansion with relocated loading dock. Additional new connecting and storage tracks.	S&I Bldg. expansion changed to a new building annex. Additional improvements include a new storm water management pond that serves the new storage track area, a Coverbox for the Yard lead in and loop track, and a new TPSS that provides traction power for the new track as well as to a section of the mainline.	S&I Bldg. expansion changed to a new building annex. Additional improvements include a new storm water management pond that serves the new storage track area, a Coverbox for the Yard lead in and loop track, and a new TPSS that provides traction power for the new track as well as to a section of the mainline	Additions based on building code requirements of the Department of General Services, the addition of AHJ for the WFC Yard improvements, the cover box grew significantly in scope to become enclosed on all sides and classified as a building with fire suppression and protection, and HVAC.

SCC Division	Units	Entry to PE	Entry to FD	FFGA	As-Built (Actual)
40 – Site Work and Special Conditions					
Demolition	Yes/No	Yes	Yes	Yes	Yes
Utilities	Document	Engineering Design Report and P.E. Drawings	Utilities Report (May 2007)	Utilities Report Final (August 2008)	Scope of utilities grew significantly during construction, as shown in Final Design Plans
Environmental Mitigation	Document	FEIS/ROD Attachment A-March 2005	ROD Attachment A-Amended November 2006	ROD Attachment A-Amended November 2006	ROD Attachment A-Amended November 2006 and status updates for compliance
Roadway / Landscaping	Document	FEIS/ROD Attachment A-March 2005	ROD Attachment A-Amended November 2006	ROD Attachment A-Amended November 2006	ROD Attachment A-Amended November 2006and status updates for compliance
50 – Systems[2]					
Traction Power System	Number	16	12	14	14
TBS	Number	5	3	3	3
TPSS	Number	11	9	11	11
Communication Systems	Type	Rail Based	Rail Based	Rail Based	Rail Based
Train Control System	Type	ATP, ATO, ATS	ATP, ATO, ATS	ATP, ATO, ATS	ATP, ATO, ATS
60 - Right-of-Way, Land, Existing Improvements					
Quantity	Parcels	63	85	84	88
Acquisition Methods	Description	Only partial fee acquisitions are required for all residential (11) and most commercial (37) parcels. The remaining parcels (14) are government and proffered.	Government parcels (i.e., VDOT. MWAA, Fairfax County) are no longer counted in the acquisition tabulation. There are seven (7) residential fee simple acquisition parcels. There are 78 commercial acquisitions of which 28 are fee simple, 34 are easements and 16 are dedications/proffers.	The number of residential fee simple acquisitions is reduced to six (6) with the remaining acquisitions unchanged.	The delta was due to the addition of utility easements for utility feeds and relocations, and easements related to mitigations for the Wiehle-Reston East station area improvements. Design refinements that eliminated the need for some property acquisitions that contributed to the delta, and one parcel was re-classified as a government parcel that did not require acquisition.
70 - Vehicles					
Heavy Rail Vehicles	Number	64	64	64	64
Peak Period Consist Size	Number	6 - 8	6 - 8	6 – 8	6 - 8
Off-Peak Period Consist Size	Number	4	4	4	4

Notes:

1 - See Appendix A1.1 Station details.
2 - TBS=Tie Breaker Station; TPSS=Traction Power Substation; ATP=Automatic Train Protection; ATO=Automatic Train Operation; ATS=Automatic Train Supervision. Existing Fisher TPSS not included in counts, Haycock TBS included for the addition of equipment.

2.2.1 Accuracy of Predictions and Causes of Differences

Entry into Preliminary Engineering

The major features and differences from the scope of the Project at Entry to Preliminary Engineering (PE) and actual as-built include the following:

Alignment

- The alignment along Route 7 featured a 1.0 mile long underground tunnel section from just west of what became the Tysons Corner Station until it transitioned to a retained fill section just north of the Gosnell Road/Route 7 intersection. The Greensboro Station at Entry to PE was also an underground cut and cover station, and the alignment was along the south/west side of the Route 7 right-of-way where the service roads were located. Once the alignment crossed underneath Gosnell Road it then included a 1200' retained cut to retained fill section before transitioning to aerial structure south of to what is now the Spring Hill Station.
- The service roads on south side of Route 7 were to be temporarily relocated during construction but then restored in a reconfiguration once construction was completed. The existing cross-section of Route 7 would be kept intact.
- The alignment in the 01 Segment transitioning from the connection to the Orange line in the median of I-66 to the median of the Dulles Connector Road was also higher and featured a longer aerial section than what was constructed and featured turnouts at 4.0% grade connecting to the West Falls Church Yard led track.
- The alignment at the Tysons East (McLean) Station was higher by 10 feet over the crossing of I-495 than was eventually built at a higher elevation.
- The track alignment in the median of the Dulles Connector Road and the Dulles International Airport Access Highway (DIAAH) was designed to minimize the number of vertical curves.
- The McLean Station platform was 210 feet east from what was built and was 10 further north onto the Capital One property to minimize the impacts on Route 123.
- A Pocket Track was located north of the Spring Hill Station, with wider track centers.

Guideway

- The aerial section for the O1 alignment was envisioned as pre-cast concrete girders and steel box girders for sections over traffic.
- For aerial station and guideway, tapered square columns and square pier caps would be used.
- Jet Fans and emergency egress structures would be required for the tunnel.

- The track retaining walls along the Dulles Connector Road and the Dulles International Airport Access Highway DIAAH were generally several feet higher than what was built. Roadside traffic barriers and track retaining walls were generally envisioned as separate structures.
- The track cross-section utilized concrete ductbanks for systems utilities running in the median of the tracks.

Stations

- The Wiehle Avenue Station was located approximately 100 feet west of what was built.
- The Entry to PE design would not preclude a future Wolf Trap Station in the median of the DIAAH.
- The Tysons Corner Station featured an elevated mezzanine which required a north entry pavilion.
- Pedestrian bridge widths were envisioned to be over 25' wide.
- The canopy at station platforms was envisioned to cover the entire platform length.
- The Tysons Corner south entry pavilion and bus drop-off facilities were located further west and accommodated fewer buses than what was eventually constructed.

Systems and Yard

- The traction power system design is reflected in the graphic "Figure 4" contained in the appendix. The Entry to PE Design featured TBS #1 near the WFC Yard and TBS #4 past the Wiehle Ave. Station which were not constructed. In addition, the majority of the TPSS were initially sized at 9 mW.
- The cost of providing power by Dominion Virginia Power was assumed to be built into the rate structure for WMATA's consumption of power.
- For the West Falls Church Yard, at Entry to PE the Service and Inspection Building was planned to be expanded with a relocated loading dock.
- • A basic concrete cover box was placed above the loop track in the West Falls Church Yard.
- Other
  - State and local sales tax on permanent construction materials was assumed to have been waived for the Project.
  - No specific commodity escalation was included in the project.
  - Finance charges were not included at Entry to PE.
  - A 4% Contingency of Total Project Cost was assigned at Entry to PE.
  - Spare parts were not included.

Entry into Final Design

The scope of the Project changed in several areas by the time the application for Entry to Final Design was submitted in December 2007. Following the submittal of the 50% Preliminary Engineering Estimate, value-engineering and scope reductions occurred to reduce the overall capital cost of the project.

In addition, at Entry to Final Design several of the scope items had not been advanced to the level of 100% PE due to the late changes made to achieve cost reductions and incorporate other scope requests from the funding partners. A period of supplemental engineering had commenced, but had not yet been completed, by the Entry to Final Design to have these additional scope items advanced to the same level of 100% Preliminary Engineering that the remaining components of the Project had achieved.

The major features and differences from the scope of the Project at Entry to Final Design (FD) and actual as-built include the following:

Alignment

- The alignment along Route 7 was located in the median of Route 7 and featured a 3/8 mile long underground tunnel section from just west of what became the Tysons Corner Station until it transitioned to grade just south of the Gosnell Road/Route 7 intersection. The alignment at the Greensboro Station at Entry to PE was partially in retained cut and fill on the south/west side of the Route 7 right-of-way where the service roads were located. The alignment then crossed the Gosnell Road intersection on a 2400' longer aerial structure section which continued through the Spring Hill Station and over the eastbound lanes of Route 7 and the Dulles Toll Road into the median of the Dulles International Airport Access Highway (DIAAH) where the alignment continued at-grade until the Phase 1 project terminus at Wiehle Avenue.
- The "bubbling out" of the median of Route 7 was required during construction to allow the station footprint to be constructed, particularly for the Greensboro Station. This required the service roads in the area to be relocated at a minimum during construction. VDOT and Fairfax County requested that in order to better facilitate traffic flow in the area that instead of rebuilding the service roads (which were determined to be functionally obsolete based on the then current traffic levels) that rather they be eliminated and replaced with an ultimate section of Route 7 that included a fourth shared/thru lane in each direction. This was in accordance with VDOT's and Fairfax County's adopted comprehensive transportation plans.
- The alignment in the 01 Segment transitioning from the connection to the Orange line in the median of I-66 to the median of the Dulles Connector Road was optimized by being lowered to include a shorter length of aerial section. The mainline vertical alignment at the West Falls Church yard lead connection was revised to 1.5% maximum in order to allow the turnout to be placed at this location.
- The alignment profile in the median of the DIAAH and the Dulles Connector Road was revised to more closely follow the existing roadway grades and minimize the amount of cut, fill or retaining

walls required. Additionally the alignment contained a level "flat spot" in the area of the Wolf Trap Farm Park to not preclude a future 600' platform and station.

- The McLean Station platform was shifted approximately 210' west in order to fully span Scotts Run and minimize impacts to a Resource Protection Area based on requirements by regulators in the environmental permitting process. This therefore lowered the alignment 10' for the I-495 crossing which required extensive coordination with VDOT for their I-495 tolling lanes project at both project's crossings of Route 123. The alignment at the McLean Station was also shifted further south to avoid property impacts to Capital One, the adjacent land owner.
- The pocket track outbound of the Spring Hill Station was replaced with a double crossover, this allowed the track centers to start the transition to 14' outbound of the station platform area.

Guideway

- The O1 Segment was revised to utilize modified AASHTO box girders for tangent sections of aerial guideway.
- Based on the lowered alignment for the O1 Segment, approximately 1,300 feet of aerial guideway was eliminated.
- Based on cost efficiencies, the aerial guideway was revised through the Tysons area from curved steel box girders over traffic crossings of Routes 7 and 123 to precast concrete segmental girders.
- The pier caps and columns were simplified from tapered square columns and square caps to round columns and circular flared caps.
- Based on the shortened and shallower tunnel, jet fans were eliminated and replaced with surface ventilation structures.
- Based on the raised alignment profile west of the aerial crossing of Gosnell Road, the aerial structure added approximately 2,400 feet of AASHTO box girders.
- The structural supports west of the Spring Hill Station that supported the deleted pocket track were eliminated.
- Retaining walls were reduced in height for areas in the median of the Dulles Connector Road and DIAAH based on the revised track profile more closely following the adjacent existing grade. In these sections an integrated traffic barrier/retaining wall was implemented to provide crash protection similar to VDOT Concrete Median Barrier MB-12.
- The alignment at Entry to Final Design eliminated the "flat spot" that would have accommodated a future Wolf Trap Station.

Stations

- The Wiehle Avenue Station platform was shifted 100' west to allow integration with the adjacent development project sponsored by Fairfax County on the north side of the Dulles Toll Road. Fairfax County assumed responsibility for implementing the north side station facilities

including incorporating the access roads, bus bays, drop-off facilities, and garage parking into the joint development project.

- The pedestrian bridges at each station were reduced to 16' wide, were simplified to be modular with lightweight roofs, and were structurally decoupled from mezzanine connections to have independent structural pier supports. Architectural treatments at entry pavilions were simplified to have pre-cast concrete panels for cladding and simplified roofs.
- Pier supports at stations were simplified to eliminate tapers.
- The canopy coverage at each station platform was reduced to a minimum of 300' feet and coverage for vertical circulation elements. Elevators were placed back to back to shorten mezzanine lengths where applicable.
- At the Tysons Corner Station, based on the lowered profile the station mezzanine was relocated from being above the station platform to at-grade which eliminated the need to construct the north entry pavilion. The south side entry pavilion and bus facilities location was revised closer to Route 123 and were being implemented by the adjacent property owner.
- At the Greensboro Station, the raising of the vertical profile resulted in a station platform that transitioned form retained cut to retained fill. The underground pedestrian access tunnels were replaced with aerial bridges over Route 7. The station ventilation equipment for the surface access.
- At the Spring Hill Station, the site facilities layout was redesigned for bus bays, drop-offs, and the kiss and ride lot. Additional busbays were located on westbound Route 7.
- At the Wiehle Avenue Station, the parking garage was rotated which shortened the pedestrian bridge and consolidated the vertical circulation elements.

Yard and Systems

- The West Falls Church Service and Inspection (S&I) Yard was revised to include deletion of the expansion of the existing S&I building and the addition of a new S&I building annex.
- The TPSS ductbank to the contact rail, stingers in the West Falls Church maintenance building, and rail heating for contact rail were incorporated into the scope by Entry to FD.
- Additional stormwater management and stream mitigation was required due to environmental requirements to minimize impacts to the Resource Protection Area (RPA).
- The cover box for the yard loop track extended to the yard lead connection from the O1 Segment and became significantly more elaborate due to building code requirements as determined by the Virginia Department of General Services (DGS). This included fully inclosing the structure, adding roof-mounted ventilation units, lighting and fire suppression equipment for emergency response and evacuation.
- High-density polymer concrete cable troughs were included on the outside sections of double track to replace concrete ductbanks that were previously located in the centerline of double track sections.

- Elimination of TPSS # 7, reconfiguration of TPSS #s 2,3,4,5 and 10 to be 6MW, include provisions to enable all TPSS to be readily expanded to 9MW at a future date without disrupting train operations, confirm that the proposed TPSS will be in compliance with applicable WMATA Design Criteria, include 135 second minimum headway and compliance with NEMA RI-9 overload ratings for "extra-heavy traction" equipment as part of the above criteria.

Other

- The future Service and Inspection Yard Y-15 site was identified by the Airports Authority as an allowable location for stockpiling excess excavated soil during construction.

Award of the FFGA

Following the submittal and FTA authorization for the Entry to Final Design, in May 2008 the Airports Authority authorized Dulles Transit Partners (DTP) to proceed with final design activities, utility relocations and pre-construction activities. During this time DTP prepared and submitted design packages that were reviewed by the owner and project partners and were incorporated into the scope definition of the project, including further refinements based on the level of design that was progressed. In addition, items that were deemed Concurrent Non-Project Activities (CNPAs) or projects the funding partners wanted to implement concurrently with the rail project, but were not required to make the rail project fully functional, were removed from the federally funded project definition. Items such as off-site roadway improvements and additional utility upgrades were not necessarily needed for the rail project but made sense to include while the corridor was under construction. A summary of the CNPAs is included in Appendix A2.

The scope of the project at the award of the Full-Funding Grant Agreement (FFGA) as represented in the Standard Cost Category (SCC) worksheets submitted in December 2008 as compared to the actual, as-built condition is not dramatically different and was mostly centered on the following areas:

Alignment

- The alignment as part of the final design packages was finalized at FFGA so only relatively minor changes occurred in comparison to what was actually constructed.
- The federally funded project definition at FFGA removed the following alignment refinements from CNPAs:
    - Realignment to accommodate the future third lane widening in each direction of the DIAAH.
    - Provisions for emergency vehicular crossovers for emergency response.
    - Final rail vertical alignment from McLean Station to Tysons Corner Station to allow minimum VDOT roadway clearances above the I-495 tolling lane project (and maintain clearances above Route 123 below)

- The provisions for a future station at Wolf Trap Farm Park including a vertical flat spot were formally removed from the project.

Guideway

- The guideway project scope definition was fairly finalized at FFGA so only relatively minor changes in comparison to what was actually constructed.
- A temporary retaining wall was added along the west side of Route 7 near the Pike 7 shopping center to minimize impacts and maintain vehicular traffic.
- The federally funded project definition at FFGA removed the following guideway refinements from CNPAs:
  - Route 7 Boulevard Concept to add a fourth shared thru/right-turn lane on Route 7, implement a common utility corridor, add pedestrian/bike, landscaping, drainage and stormwater management facilities
  - Spring Hill Road improvement that included VDOT planned improvements near the intersection with Route 7

Stations

- Based on the design review process and comments from WMATA and Fairfax County, the Tysons Corner Station configuration was revised to provide a more optimized layout and reduce property impacts to the adjacent property owner. This involved moving the elevator/stair tower into the station footprint and shifting the platform 66'8" east among other changes.
- At the Greensboro and Wiehle Avenue Stations, additional architectural and structural changes were added to comply with WMATA standard 7'6" clearance at structural columns along the barrier walls. Longer transverse beams were added to support the mezzanine and increased barrier wall quantities.

Yard and Systems

- The design of the West Falls Church Yard was advanced to include the following:
  - Implement changes to storage track layout based on WMATA comments.
  - Deleting modifications to the existing S&I building.
  - Construction of a new pre-engineered shop annex building in the area inside the existing loop track.
  - TPSS Number 1 was relocated to an area outside the yard and the deletion of Tie Breaker station at Plainfield St.
  - The loop track "cover box" building was further advanced based on code requirements.
- Traction power design modifications including the deletion of all shielded positive traction power feeder cables and monitoring system, addition of dry type transformer, provide remote

monitoring of transformers temperature digital readout through RTU, provide remote monitoring of diode failure alarms and digital readout of rectifier temperature through AEMS RTU at West Falls Church Yard. TPSS #7 and #9 were added back into the project based on the load flow analysis and minimum headway requirements provided by WMATA.

- In accordance with the NTSB recommendations, additional design requirements required to the Automatic Train Control System. Replace 37-conductor copper cable between TCR rooms with fiber optic cable. Provide requirement for a complete diagnostic and maintenance management system to detect faults, identify faulty units and provide line replacement unit codes. Modify specifications to provide 8,000 amps bonds for all ATC functions and update testing requirements.
- Revisions to design, specifications and installation of current video /communication equipment to be compatible with WMATA and the Airports Authority systems currently being used.

2.3 Lessons Learned – Physical Scope

The primary lessons learned in the evaluation of the accuracy of the predictions of the physical scope of the project at the various project milestones are the following:

- Lock-in design standards and code requirements and avoid utilizing revisions to standards if at all possible.
- Advance designs sufficiently to accurately define the scope of the project (and their cost).
- Obtain concurrence on project scope early from all project partners, particularly funding partners or those with approval powers and reconfirm at regular intervals.
- Identify betterments clearly and have the entity bear the entire cost.
- Identify any additional regulatory requirements related to safety that are mandatory for the project to comply with as early as possible.
- Identify and clearly define the core functional transit project and separate any identified concurrent non-project activities to avoid overlapping scope or inequity in funding verses scope.
- Clearly identify trade-offs between scope benefits and impacts in order to evaluate merits of incorporating changes.
- Clearly understand and define regulatory and permitting requirements and authorities having jurisdiction.
- Have a clear understanding of the value of property acquisition in making decisions on the design decisions of scope changes.
- Avoid having the project sponsor and executive team transition during the middle of the project.

3 CAPITAL COST OF THE PROJECT

This section of the report describes the capital cost of the Project at its completion organized by elements described in the FFGA. It does not include additional elements that have been (or are proposed to be) implemented with funds outside of the FFGA including CNPAs.

In addition to the actual or as-built capital cost of the Project, this section further compares and evaluates the accuracy of the predicted capital cost at each milestone during the planning and development of the Project against the actual outcome.

The following sections contain a summary of the capital cost of the Project including the as-built (actual) and predicted capital costs of the Project, organized by SCC categories, the accuracy of the predictions, causes of differences, and lessons learned. Throughout the project, capital costs were recorded in current year or base year dollars (i.e., the year in which the estimates were prepared) and escalated to the anticipated year of expenditure.

3.1 Actual or As-Built Capital Cost of the Project

This section describes and discusses the capital cost of the Project at completion organized by the FTA Standard Cost Categories (SCC) (see **Table 7**). The following discusses the capital cost of the project to date for completion as of December 2017, recognizing that there are some Phase 1 costs underway.

Table 7: Project Actual Capital Cost Summary by SCC Code, December 2017

SCC Category Number	Description	Estimate Expenditure at Completion (YOE)
10	Guideway and Track Elements	$621,409,081
20	Stations, Stops, Terminals, Intermodal	$353,990,963
30	Support Facilities: Yards, Shops, Administrative Buildings	$73,927,641
40	Site Work and Special Conditions	$249,332,823
50	Systems	$310,190,774
60	Right-of-Way, Land, Existing Improvements	$54,977,723
70	Vehicles	$192,290,000
80	Professional Services	$924,186,095
90	Unallocated Contingency	$ -
100	Finance Charges	$362,166,534
	Total Expenditure	$3,142,471,635

3.2 Comparison of Actual Capital Cost vs. Milestone Predictions

Table 8: Comparison of Actual and Predicted Capital Costs

Original dollar year of the actual or predicted costs		Entry to PE 2004	Entry to FD 2007	FFGA 2008
SCC Code	Actual Costs (millions of $2008)	Predicted Costs (millions of $2008)		
10 Guideway & Track Elements	$574.1	$367.5	$616.6	$600.5
20 Stations, Stops, Terminals, Intermodal	$316.2	$271.0	$288.7	$286.9
30 Support Facilities: Yards, Shops, Admin.	$64.0	$57.6	$46.7	$47.5
40 Sitework & Special Conditions	$227.7	$53.9	$239.6	$221.0
50 Systems	$278.0	$173.6	$251.8	$244.7
60 ROW, Land, Existing, Improvements	$53.3	$96.5	$53.7	$44.4
70 Vehicles	$130.4	$195.4	$172.4	$185.5
80 Professional Services	$854.9	$273.8	$653.2	$678.5
90 Unallocated Contingency	$0.0	$65.8	$127.5	$116.0
100 Finance Charges	$284.3	$0.0	$366.8	$419.0
TOTAL	$2,782.9	$1,555.0	$2,817.1	$2,844.0

3.2.1 Accuracy of Predictions and Causes of Differences

Table 9 and **Table 10** compare the actual capital cost and the predicted costs at the three project milestones; it examines the accuracy of the MWAA predictions in both constant and Year of Expenditure (YOE) dollars. The base dollars represent the value in a specific year, assuming the project is built entirely within that year and ignoring the effects of inflation. YOE dollars consider the impact of the project construction schedule, the annual cost-inflation (which erodes the value of the dollar over time), and the real-world cash-flow for the Project. MWAA followed standard practice by first developing the predicted costs in constant dollars and then inflating them to YOE dollars based on the projected schedule and annual rates of construction cost inflation. **Table A2.1** in the Appendices presents the underlying calculations of actual and predicted costs for each year of the project development milestones.

Table 9: Accuracy of Actual vs. Predicted Capital Costs – Part 1

Line	Cost Measure	Actual Cost	Prediction Costs		
			Entry to PE (2004)	Entry to FD (2007)	FFGA (2008)
	Constant Dollars (millions)				
1	Total capital cost in 2004 constant dollars	$2,382.7	$1,331.4 (-44.1%)	---	---
2	Total capital cost in 2007 constant dollars	$2,667.7	---	$2,700.5 (+1.2%)	---
3	Total capital cost in 2008 constant dollars	$2,782.9	---	---	$2,844.0 (+2.2%)
	Inflation				
4	Dollar-weighted mid-point of project expenditures	Jan. 2011	Oct. 2008	Jun. 2009	Jun. 2010
5	Opening year	2014	2011	2012	2014
6	Inflation effects compared to 2004 constant dollars	27.9%	14.3%	---	---
7	Inflation effects compared to 2007 constant dollars	14.2%	---	10.7%	---
8	Inflation effects compared to 2008 constant dollars	9.5%	---	---	10.5%

* Values in red font indicate absolute difference exceeds ±$50 million and the relative difference exceeds ±20 percent.

Line 1 of **Table 9** presents MWAA's prediction of project capital cost at entry to PE to be $1,331.4 millions in 2004 constant dollars. Line 1 also presents the actual cost of the Project translated from YOE dollars into 2004 constant dollars (about $2,382.7 millions). Comparison of the actual and predicted cost at entry to PE in 2004 constant dollars indicate that MWAA's prediction at that project milestone was off by an underestimate of $1,051.3 million (a difference of about 44 percent).

Line 2 of **Table 9** compares the predicted project capital cost at entry to FD ($2,700.5 million) to the actual cost ($2,667.7 million) in 2007 constant dollars. The prediction at entry to FD was relatively accurate where the overestimation was about $32.8 million (a difference of about +1.2 percent).

Similarly, Line 3 of **Table 9** compares the predicted project capital cost at FFGA ($2,844.0 million) to the actual cost ($2,782.9 million) in 2007 constant dollars. The prediction at FFGA was also relatively accurate where the overestimation was about $61.1 million (a difference of about +2.2 percent).

Lines 4 and 5 of **Table 9** presents the actual and predicted capital costs while reflecting the effects of inflation on the values. Line 4 represents the mid-points of expenditures on the Project based on the actual and predicted schedules of annual expenditures. Line 5 represents the actual and predicted project opening dates. At entry to PE (in 2004), MWAA anticipated a project schedule that anticipated project mid-point to hit in October 2008 and project opening to occur in 2011. At entry to FD (in 2007), the project schedule continued to anticipate a project mid-point to occur in June 2009, however, the expected project opening was pushed back to 2012. At FFGA, (in 2008), the project mid-point and opening dates were pushed out to June 2010 and 2014 respectively, which was maintained for construction and completion of the Project.

Lines 6 through 8 of **Table 9** presents the actual and predicted impacts of construction cost inflation on the overall project capital cost. As documented in Line 6, at entry to PE, MWAA predicted that inflation would add 14.3 percent to the 2004 constant dollar cost estimate based on anticipated project schedule

and assumptions in construction cost inflation; however, the actual effect of construction cost inflation was about 27.9 percent of the 2004 constant dollar estimate.

As seen in Line 7 and 8, the difference between the actual and predicted effect of construction cost inflation on the overall capital cost were much narrower at entry to FD and FFGA.

Table 10 summarizes the differences between the actual capital cost and the milestone predictions in YOE dollars.

Table 10: Accuracy of Actual vs. Predicted Capital Costs – Part 2

Line	Cost Measure	Actual Cost	Prediction Costs		
			Entry to PE (2004)	Entry to FD (2007)	FFGA (2008)
	Year-of-Expenditure (YOE) Dollars (millions)				
1	Total capital cost in YOE dollars	$3,046.8*	$1,521.4	$2,988.2	$3,142.5
2	Predicted minus actual total capital cost in YOE dollars	---	-$1,507.3 (-49.5%)	-$40.6 (-1.3%)	$95.7 (3.1%)
3	-- component attributable to scope/unit-cost differences	---	-$1,201.4 (-39.4%)	$36.3 (1.2%)	$67.5 (2.2%)
4	-- component attributable to inflation-rate differences	---	-$93.3 (-3.1%)	$47.5 (1.6%)	$99.5 (3.3%)
5	-- component attributable to schedule differences	---	-$212.5 (-7.0%)	-$124.4 (-4.1%)	-$53.3 (-1.7%)

* Actual cost represents amount paid or expended up to December 2017; the $95.7 million gap with the FFGA estimate represents the amount not yet expended or the estimate at completion of the project.
** Values in red font indicate absolute difference exceeds ±$50 million and the relative difference exceeds ±20 percent.

Lines 1 and 2 of **Table 10** present the actual and predicted total capital costs in YOE dollars at all three milestones and the differences between each of the milestone predictions and the actual value. FFGA prediction is in track with the estimated actual expenditure or cost to complete at a total of $3,142.5 million in YOE dollars (as of December 2017 the actual expenditure was $3,046.8 million). Entry to PE predictions underestimated by about $1,507.3 million in YOE dollars. Entry to FD prediction was much closer to the actual values with an underestimate of about $40.6 million.

Lines 3 through 5 of **Table 10** breaks down the causes of differences between the predicted and actual costs in YOE dollars by identifying whether the differences are attributable to scope/unit cost differences, inflation-rate differences, or schedule differences.

Table 11 examines the accuracy of predicted costs for individual components of the project grouped into FTA's SCC. All predicted costs in the table are in constant $2008 dollars to remove inflation effects from any differences between the predicted and actual costs. Consequently, the causes of any cost differences are limited to differences in project scope and/or differences in the base-year unit costs at each milestone. The table flags a significant difference between the predicted and actual cost of an SCC when the **absolute difference exceeds ±$50 million and the relative difference exceeds ±20 percent.**

Table 11: Actual and Predicted Expenditures Converted to 2008 Constant Dollars

Original dollar year of the actual or predicted costs	2008	Predicted Costs (millions of $2008)								
		Entry to PE (2004)			Entry to FD (2007)			FFGA (2008)		
SCC Code	Actual Costs (millions of $2008)	Predicted Costs	Absolute Difference	Relative Difference	Predicted Costs	Absolute Difference	Relative Difference	Predicted Costs	Absolute Difference	Relative Difference
10 Guideway & Track Elements	$574.1	$367.5	-$206.6	-36%	$616.6	$42.5	7%	$600.5	$26.4	5%
20 Stations, Stops, Terminals, Intermodal	$316.2	$271.0	-$45.2	-14%	$288.7	-$27.5	-9%	$286.9	-$29.3	-9%
30 Support Facilities: Yards, Shops, Admin.	$64.0	$57.6	-$6.4	-10%	$46.7	-$17.3	-27%	$47.5	-$16.5	-26%
40 Sitework & Special Conditions	$227.7	$53.9	-$173.8	-76%	$239.6	$11.9	5%	$221.0	-$6.7	-3%
50 Systems	$278.0	$173.6	-$104.5	-38%	$251.8	-$26.3	-9%	$244.7	-$33.3	-12%
60 ROW, Land, Existing, Improvements	$53.3	$96.5	$43.2	81%	$53.7	$0.4	1%	$44.4	-$8.9	-17%
70 Vehicles	$130.4	$195.4	$65.0	50%	$172.4	$42.0	32%	$185.5	$55.1	42%
80 Professional Services	$854.9	$273.8	-$581.1	-68%	$653.2	-$201.7	-24%	$678.5	-$176.4	-21%
90 Unallocated Contingency	$0.0	$65.8	$65.8	0%	$127.5	$127.5	0%	$116.0	$116.0	0%
100 Finance Charges	$284.3	$0.0	-$284.3	-100%	$366.8	$82.5	29%	$419.0	$134.7	47%
TOTAL	$2,782.9*	$1,555.0	[illegible]	[illegible]	$2,817.1	$34.2	1%	$2,844.0	$61.1	2%

* Actual cost represents amount paid or expended up to December 2017; Forecasted expenditure or the amount not yet expended of the estimate to completion is not included.

** Values in red font indicate absolute difference exceeds ±$50 million and the relative difference exceeds ±20 percent.

As evidenced from **Table 11**, the major cost differentials occurred from comparing the accuracy of the predictions from Entry to PE to the actual as-built condition. For the Entry to PE milestone, the predicted cost was significantly different from the actual outcome for the following Standard Cost Categories: SCC 10 Guideway and Track Elements, SCC 40 Sitework and Special Conditions, SCC 50 Systems, SCC 60 Vehicles, SCC 70 Vehicles, SCC 80 Professional Services and SCC 100 Finance Charges.

For the Entry to FD milestone, the predicted cost was significantly different from the actual outcome for SCC 80 Professional Services.

For the FFGA milestone, the predicted cost was significantly different from the actual outcome for SCC 70 Vehicles, SCC 80 Professional Services, and SCC 100 Finance Charges.

In addition, following the Entry to PE submittal, FTA revised the SCC codes were to reallocate some of the sub categories, with the most significant being Escalators (6.08) and Elevators (6.09) being reassigned from the 6.0 Systems category at Entry to PE to the 20.07 Elevators, Escalators category under 20 Stations, Stops, Terminals, Intermodal in Entry to FD, FFGA and Actual.

The following is a summary discussion of each of these categories with the major reasons for the variations.

Entry to PE

As the General Plans developed to support the FEIS were the basis of what was developed in the Capital Cost Methodology Report for the Entry to PE cost estimate which mostly consisted of parametric (cost per mile, etc.). The overall level of design was less than 10% and a significant level of design detail was not yet available to have unit quantities or cost assignments well defined. A design allowance was applied to various categories ranging from 15 to 30% to attempt to reflect the degree of uncertainty associated with the level of engineering data available and design completion achieved for the various design elements.

SCC 10 Guideway and Track Elements

Besides the alignment and type of construction differences that varied significantly from Entry to PE to Actual, the costs at Entry to PE also did not accurately account for the complexity of construction primarily in the congested Tysons Corner area or at the tie into the Orange line between West Falls Church and East Falls Church. Constructability was examined at a high level at this time, but not to the degree where actual contractor means and methods could be determined. The tie in work required doing very unproductive and costly work on brief WMATA rail outage windows that were often not

available. Additionally, the constrained work environments in the medians of I-66, the Dulles Connector Road and the DIAAH, and the Route 7 and 123 rights of way limited the ability to store materials, equipment, and stage construction efficiently. Additionally, track costs were much lower at Entry to PE than at Actual, even accounting for changes in what sections were direct fixation versus ballasted.

SCC 40 Sitework and Special Conditions

The costs that provided the largest differentials from Entry to PE to Actual for this category included utilities and temporary facilities and other indirect costs during construction (which was not its own line item during Entry to PE). Utility costs grew substantially by Actual since the change in alignment required significant additional utility relocation and the establishment of a common utility corridor for the multiple telecom and fiber lines that required relocation in the Route 7 right-of-way. Earthwork costs also grew substantially, in part due to the increases required for the additional utility excavation and soil hauling.

SCC 50 Systems

Costs in several systems subcategories were underpredicted at the Entry to PE milestone in comparison to Actual. The largest cost addition was to cover Dominion Virginia Power (DVP) costs for providing power to the traction power substations (TPSS), and for duct bank to connect to the contact rail. At Entry to PE the assumption was that power provisions are often part of operating agreements for incorporating capital costs necessary for implementing service into an operating rate structure, but WMATA's agreements did not allow for this and required full reimbursement for all capital costs (including new DVP substations and distribution lines as well as a Tax Effective Recovery Factor (TERF) applied to all capital costs that DVP would maintain. Other costs that were underpredicted at Entry to PE included communications (which included the NTSB recommendations) and central control (including upgrades required for WMATA's Operations Control Center).

SCC 60 Vehicles

The cost of vehicles predicted at Entry to PE was greater than their Actual costs. The reasons for this include changes from the original assumption that the DCMP would fund the entire vehicle procurement costs for WMATA. An agreement was reached that provided for a cost sharing of the upfront costs for the vehicle procurement including design and the manufacturing of the pilot car since WMATA would be using this contract's options for the delivery of several hundred additional systemwide vehicles in addition to the 64 vehicles required for each phase of the DCMP. In addition, WMATA agreed to reduce the costs for purchasing work vehicles such as prime movers for the DCMP.

SCC 80 Professional Services

Professional services costs were substantially underpredicted at Entry to PE compared to Actual. Costs for preliminary engineering, final design, project and construction administration/management and other soft costs were predicted to be much lower in total costs then Actual. For preliminary engineering, the redesign required following the 50% PE increased PE costs substantially. Costs for final design also increased since many of the changes that occurred late in PE impacted the amount of effort required for final design. The costs for construction administration and management also went up significantly as the contractor's costs for managing the additional construction of all the additional scope including the roadway and utility work not envisioned at Entry to PE.

SCC 100 Finance Charges

At Entry to PE, the funding plan developed at the time did not assume the need to include any financing costs as it was assumed through local, state and federal funding, the capital costs of the project would be covered, and that borrowing and associated costs were not required.

Entry to Final Design

SCC 80 Professional Services

Professional services costs were substantially underpredicted at Entry to Final Design compared to Actual. The preliminary engineering costs were updated to include the FEIS costs but had not yet been finalized at the Entry to Final Design. Additionally, final design costs were also being developed but had not been finalized due to the number of scope elements following the 50% PE that were still being advanced.

The costs for construction administration and management also went up significantly as the contractor's costs for managing the additional construction of all the additional scope including the roadway and utility work was not fully envisioned at Entry to Final Design.

At FFGA

The majority of cost differentials from the FFGA to Actual involved assignment of the unallocated contingency levels set at FFGA to the various SCC categories as part of the risk and contingency management plan.

SCC 70 Vehicles

Similar to at Entry to Final Design, the cost of the vehicles predicted at FFGA was greater than their Actual costs. The reasons for this include changes from the original assumption that the DCMP would fund the entire vehicle procurement costs for WMATA. An agreement was reached that provided for a cost sharing of the upfront costs for the vehicle procurement including design and the manufacturing of the pilot car since WMATA would be using this contract's options for the delivery of several hundred additional systemwide vehicles in addition to the 64 vehicles required for each phase of the DCMP.

SCC 80 Professional Services

Similar to at Entry to Final Design, professional services costs were substantially underpredicted at FFGA compared to Actual. The costs for providing program management administration and support services by the Airports Authority team and WMATA's agency costs for reviewing and approving the design and construction work for facilities that they would be accepting were under forecasted. This includes the WMATA's force account work for start-up and testing which included elements of work and level of effort that was underpredicted at FFGA.

SCC 100 Finance Charges

At FFGA, the Airports Authority had developed a financing plan that included issuing debt based on the proceeds of tolls on the Dulles Toll Road. This assumed associated financing costs based on the amount and type of debt that they were able to issue. By the time the debt was actually issued, the financing costs had been reduced since the interest rate on the debt was lower than predicted so the financing costs were overpredicted at FFGA.

3.3 Lessons Learned – Capital Cost

The following are the major lessons learned in the evaluating the accuracy of the predictions of the capital costs of the project at the various project milestones:

- At Entry to PE, the cost estimate was based on parametric costs and ideally should have been supported by a greater level of design detail.
- Additional levels of contingency were likely warranted based on the risks, the complexity of construction, and the level of design development available.
- Based on the significant value engineering effort required following the 50% PE cost estimate, many of the changes incorporated into the scope did not have a significant level of design advanced at the Entry to FD submittal.

- As the project was procured following an unsolicited proposal process under a master agreement in accordance with Virginia's Public-Private Transportation Act (PPTA), there was little ability to obtain competitive pricing during preliminary engineering and the design-build stages of the project. There were contract requirements that required the contractor to provide "biddable documents" that could in theory be used for an "off-ramp" for a competitive design-build procurement, but the schedule delay would have likely wiped out any potential cost savings.
- The costs of doing complex and unproductive work in tight right-of-way was underpredicted at each milestone and should have been accounted for with higher unit costing and/or contingency. Constrained right-of-way and narrow outage windows for working in WMATA's operating system for the Orange line tie in and the West Falls Church Yard. WMATA often was unable to guarantee outage time or would often cancel at the last minute based on a significant amount of maintenance and state of good repair underway throughout the system.
- Assumptions concerning the capital cost of provisions for new electrical service with Dominion Virginia Power (DVP) should have been confirmed earlier in the project. WMATA had initially indicated that there was some ability to incorporate the cost of capital improvements for new service into their operating agreement with DVP based on WMATA being a very large customer for power, this turned out to not be the case and also required work arounds for WMATA ownership of electrical infrastructure to avoid an additional Tax Effective Recovery Factor (TERF) for all capital facilities that DVP would own and maintain.
- Capital costs should have accounted for changes in technology, regulatory and safety requirements. During the course of the project, WMATA adopted a number of technology changes, primarily in the systems area, that required changes that increased the capital costs of the project. Some of these were in response to regulatory and safety requirements, such as the NTSB recommendations for the train control system, and ideally been identified earlier in the project as a potential cost increase or been included in contract requirements.
- The timing of the construction of the project was concurrent with several large infrastructure projects in the region. Based on the competitive labor market for craft workers, a project labor agreement raised wages in order to guarantee the availability of workers during the project. As this was not part of the original contract, it did raise the cost of the construction work for change orders issued following the execution of the design-build contract.
- The percentages for soft costs were underpredicted at each of the milestones, particularly at Entry to PE. A complex project of this magnitude with multiple agencies and funding partners required a significant organization to execute project development, preliminary and final design, program and construction management, and start-up and testing. Agency costs and program management support services were significantly underpredicted at each milestone and the transition of the project sponsor from DRPT to the Airports Authority at the end of preliminary

engineering created complications and inefficiencies in staffing for technical capacity The complexity of one entity (Airports Authority) delivering the capital program to another entity (WMATA) for system acceptance and operations required significant resources to coordinate and execute.

4 TRANSIT SERVICE AND FARE POLICIES

This section of the report documents the actual or as-built transit service levels provided within the Project corridor and compares it to the transit service levels predicted to be provided prior to the implementation of the Project. The analysis only compares Metrorail and bus transit services predicted at Entry to PE against the actual or as-built services. The service plan developed at Entry to FD and FFGA were projected for the years 2025 and 2030, and could not be used to provide an adequate comparative analysis to the actual services.

4.1 Characteristic of As-Built or Actual Transit Service and Fare Policy

The actual or as-built transit service levels and fare policy presents a snap shot of a time after the Project operations commenced in July 2014. It should also be noted that the as-built transit service levels described below do not reflect the current (2018) service levels as changes occurred after the opening of the Project in response to numerous external factors (non-related to the Project) that degraded general ridership of the WMATA system in recent years. For instance, in June 2016, WMATA initiated SafeTrack an accelerated track work plan to address safety recommendations and rehabilitate the Metrorail system to improvement safety and reliability. This program accelerates three years' worth of work into approximately one year. The plan significantly expands maintenance time on weeknights, weekends and midday hours and includes 15 "Safety Surges" which are long duration track outages for major projects in key parts of the system. Safety Surges with significant impacts to the Project area - Orange and Silver Lines - were completed in June and July 2016.

4.1.1 Metrorail

4.1.1.1 As-Built Metrorail Service Levels

The Project connects to the Metrorail system between the EFC and WFC Stations on the Orange Line. The Project provides revenue service that extends from Reston through Washington, D.C., and into Maryland. The alignment of the Project corridor and the Orange Line overlaps between the EFC and Stadium-Armory Stations, while the transfer opportunity to the Blue Line is provided at the Rosslyn Station. Furthermore, direct transfer opportunities to each of the other Metrorail lines are provided within Washington, D.C.

The Project includes 11.7 new miles of track, rail yard expansion at WFC, an expanded railcar maintenance facility, and five stations: McLean, Tysons Corner, Greensboro, Spring Hill, and Wiehle-Reston East. Long-term vehicle parking will only be provided at Wiehle-Reston East Station. Bike parking is provided at all stations.

The first phase of operational changes in anticipation of Phase 1 of the Silver Line was implemented in June 2012. This package of changes, collectively known as "Rush-Plus Service", primarily affected the Orange, Blue, and Yellow Lines. Service was increased on the WMATA Orange Line to a 6-minute AM rush headway. During the peak periods, some Blue Line trains were shifted to provide additional service on the Yellow Line and a variation of the Yellow Line was added near its southern terminus. One of the primary purposes of this change was to prepare the system for Phase 1 Silver Line operations by providing additional capacity in the Rosslyn tunnel. The Blue, Orange, and Silver Lines all use this tunnel beneath the Potomac River and thus it represents a capacity choke point in the system. The ridership pattern changes that were associated with Rush-Plus in April/May 2012 were accounted and documented as part of the Task 3 Technical Memorandum Documentation of Conditions Before Project Opening[1].

After the Project commenced operations in 2014, service along the Project operated every six minutes during peak periods, 12 minutes during midday, evenings, and weekends, and every 20 minutes during late-night hours. Service from the Project terminus of Wiehle-Reston East Station began at 5:00 AM on weekdays and 7:00 AM on weekends. The last train departed from Wiehle-Reston East Station at 11:10 PM Sunday through Thursday and 2:10 AM on Friday and Saturday nights.

4.1.1.2 As-Built Metrorail Fare Policy

Metrorail fares are calculated using a distance-based zone system, with longer distance trips costing more. Trips during peak periods also have higher fares. When the Project commenced operations, all passengers were required to pay using either a temporary Metro farecard or a SmarTrip card that documents boarding station, exiting station and fare paid. SmarTrip is an electronic stored-value smart card payment system maintained by WMATA but utilized by transit service providers throughout the Washington, D.C. metropolitan area. **Table 12** presents the Metrorail fare policy in winter of 2016.

Table 12: As-Built Bus Metrorail Fare Policy

Metrorail Operation	Actual or As-Built Year Fare-Policy	
	Minimum	Maximum
Off-Peak	$1.75	$3.60
Peak	$2.15	$5.90
Reduced Fare (e.g., senior citizens, individuals with disabilities, etc.)	Half the peak fare	
Paper Ticket Surcharge	+$0.25	

[1] Task 3 Technical Memorandum Documentation of Conditions Before Project Opening, January 2017

4.1.2 Other Transit Services

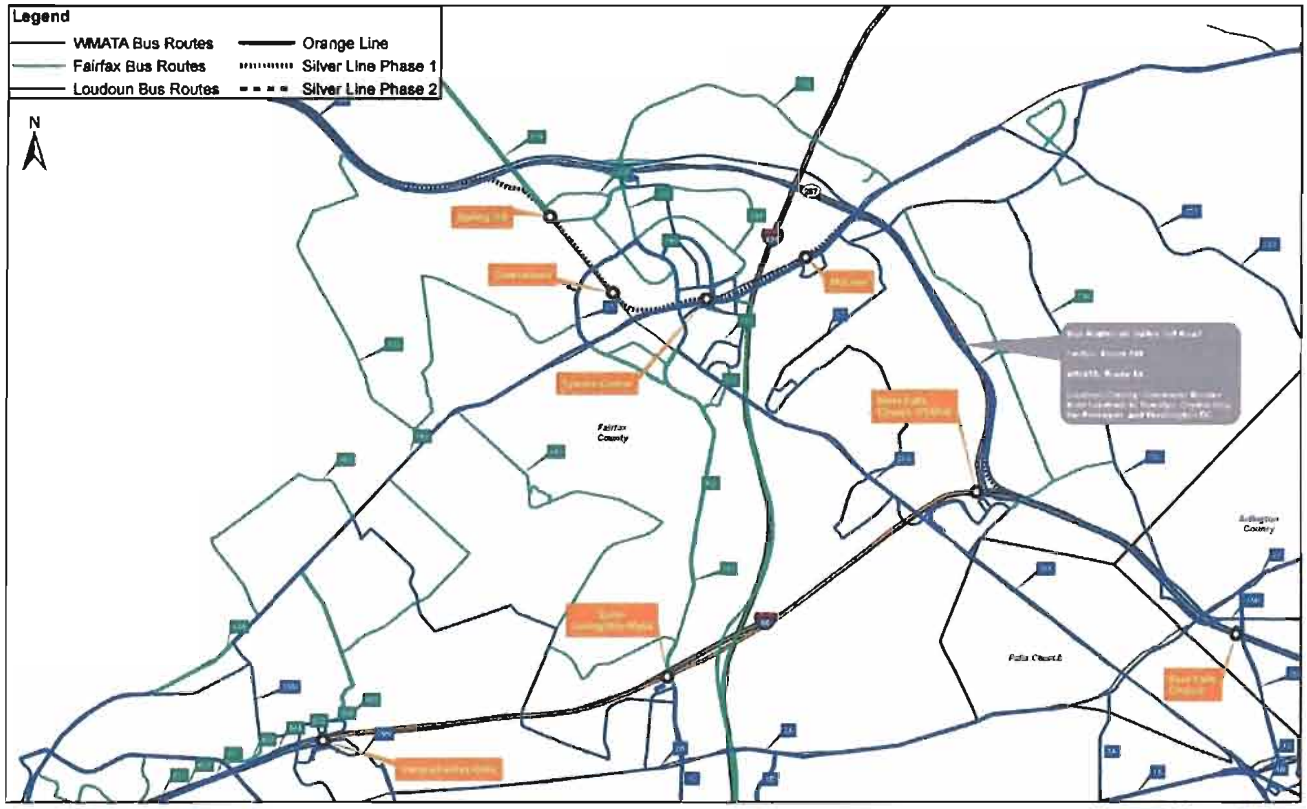
4.1.2.1 As-Built Bus Transit Service Levels

The Project extending the Metrorail system into Tysons Corner and Reston, the communities in Fairfax and Loudoun Counties will improve access to the full transit system in the greater Washington, D.C. metropolitan area. Prior to implementation of the project, bus transit services in Fairfax and Loudoun County connected to Orange Line stations. With the implementation of Silver Line, many of those transit services instead connect to the Silver Line.

The as-built bus transit services consist of those bus routes that operate within the defined Project corridor and provide service to the Silver Line. These routes are operated by WMATA, the Fairfax Connector, and Loudoun County Transit. WMATA operates ten (10) routes in the corridor, the Fairfax Connector operates twenty-four (24) routes, and Loudoun County Transit operates a mix of commuter and local routes and runs (most of the runs operate out of 20 existing park-and-ride lots). These transit services are illustrated in **Figure 4-1,** which was presented in the Task 4 Technical Memorandum Documentation of Conditions After Project Opening[2] and are described in greater detail in that document. In addition, MWAA operates a special bus service between the Dulles International Airport and the Wiehle Reston-East Silver Line station.

[2] Task 4 Technical Memorandum Documentation of Conditions After Project Opening, January 2017

Figure 4-1: As-Built Bus Transit Services in the Dulles Corridor



4.1.2.2 As-Built Bus Transit Service Fare Policy

Table 13 the as-built fare policies of bus transit services within the Project.

Table 13: As-Built Bus Transit Operator Fare Policy

Transit Operator	Actual or As-Built Year	
	Regular	Express
Metrobus	$1.75	$4.00
Metrorail to Metrobus Transfer	$0.50 fare discount in each direction after 2 hrs., otherwise free	
Fairfax Connector	$1.75	$4.00
Fairfax Connector with Transfer	Free up to 2 hours	$4.25
Fairfax Connector to Metrobus Transfer	$0.50 fare discount in each direction after 2 hrs., otherwise free	
Loudoun County Transit	$1.00	$9.00 to DC; $2.00 to WFC; $1.00 from WFC

4.2 Comparison of As-Built Service Levels and Fare Policies vs. Predictions

In this section, the as-built Project corridor transit services is compared to the transit services anticipated at the Entry to PE phase of the Project. Similar comparison will be presented for as-built fare policies with those predicted at Entry to PE.

4.2.1 Metrorail

4.2.1.1 Comparison of Metrorail Service Levels

Table 14 below compares the Metrorail service levels between as-built and Entry to PE conditions. The comparison indicates approximately fifty percent increase in systemwide railcar mileage and eleven percent reduction in system rush hour headways between the service planned at Entry to PE and actual service.

In terms of railcar mileage, the largest change in service level is observed on the Yellow Line followed by the Silver Line. The largest reduction in headway is observed on the Blue Line while the actual headway on the Red Line increased in comparison to the service planned at Entry to PE.

Table 14: Comparison of As-Built and Entry to PE Merorail Services

	Railcar Miles			Rush Hour Headways (mins.)		
Transit Operator	Entry to PE	As-Built	% Change	Entry to PE	As-Built	% Change
Red Line	23,853,300	28,011,000	17%	5	6	20%
Blue Line	9,877,300	13,858,400	40%	14	6	-57%
Orange Line	12,374,200	14,368,900	16%	11	12	14%
Yellow Line	3,260,200	10,390,300	219%	7	6	-14%
Green Line	7,119,200	12,132,400	70%	7	6	-14%
Silver Line	8,456,100	16,447,300	95%	7	6	-14%
TOTAL/AVERAGE	**64,940,300**	**95,208,300**	**47%**	**8**	**7**	**-11%**

4.2.1.2 Comparison of Metrorail Fare Policies

Table 15 compares Metrorail fare policies planned at Entry to PE against as-built fare policies. The comparison is made in 2016 dollars. The Entry to PE values that were originally in 2004 dollars are escalated to 2016 dollars using the CPI-U index, where the constant dollar ratio in the CPI-U index between 2004 and 2016 are applied to the 2004 dollar values to convert to 2016 constant dollars.

Table 15: Comparison of Metrorail Fares (in 2016 dollars)

Metrorail Operation	Entry to PE		Actual or As-Built Year		Δ Minimum	Δ Maximum
	Minimum Fare*	Maximum Fare*	Minimum Fare	Maximum Fare		
Weekday Peak Periods (5:30 to 9:30 AM and 3:00 to 7:00 PM)	$1.56	$4.69	$2.15	$5.90	38%	26%
All Other Times	$1.56	$2.87	$1.75	$3.60	12%	25%

**Entry to PE fare policies originally reported in 2004 dollars. These values were escalated to 2016 dollars by applying constant dollar ratio in the CPI-U index between 2004 and 2016*

4.2.2 Other Transit Services

4.2.2.1 Comparison of Bus Transit Service Levels

Much of the bus transit service coverage within the Dulles Corridor is provided by Fairfax and Loudoun counties with the least service provided by WMATA. **Table 16** presents the changes in weekday service level between Entry to PE to as-built milestones for the three transit bus operators in the Dulles Corridor. The details associated with the service changes are documented in the Task 2 Phase I: Project Planning Forecast[3] and Task 4 Technical Memorandum Documentation of Conditions After Project Opening for predicted service levels at Entry to PE and the as-built service levels respectively. While only the weekday services are evaluated under this section, the comparison of operations and maintenance costs conducted under Section 5 covers annual costs that includes weekend and holiday services.

Table 16: Comparison of Level of Bus Transit Service at Selected Milestones

Transit Operator	Entry to PE		Actual or As-Built Year		Δ Hours	Δ Vehicles
	Weekday Revenue Hours	Peak Hour Vehicles	Weekday Revenue Hours	Peak Hour Vehicles		
Metrobus	478.1	50	532.75	65	11%	30%
Fairfax Connector	1074.0	94	746.60	96	-30%	2%
Loudoun County Transit	381.2	52	299.10	79	-22%	52%
TOTAL	**1,933.3**	**196**	**1,578.45**	**240**	**-18%**	**22%**

There are some noticeable differences in the bus transit service when comparing those envisioned at Entry to PE with the as-built services. Metrobus services have increased in both coverage and level of service. For example, the headway was reduced for Routes 2A and 28A, Route 2B was extended from the Fair Oaks Mall to West Ox Transit Operation Center, and the eastbound segment of Route 3T

[3] Volume I: Service Levels, Operating Costs and Ridership Forecasts, December 2008

extended from WFC to EFC Metrorail Stations. **Table 17** summarizes the specific bus route changes in the Project corridor made by WMATA between Entry to PE and as-built services.

Table 17: Metrobus Service Changes in the Project Corridor

Metrobus Route Weekday Service at Entry to PE	Weekday Service Changes at As-Built Conditions
2A	Route cutback to Dunn Loring Metrorail Station
2B	Route extended from Fair Oaks Mall to West Ox Transit Operations Center
2C	Eliminated
2T	Routing change from Dunn Loring Metrorail Station with a connection to the Tysons Corner Metrorail Station
3T	Route cut back to WFC Metrorail Station instead of the EFC Station and routed to the McLean Metrorail Station instead of Tysons Corner Center
5A	No Change
14A	Not Implemented
14B	Not Implemented
14C	Not Implemented
14D	Not Implemented
15N/S	Not Implemented but a 15M route was implemented unbroken between George Mason University and the Tysons Corner Metrorail Station
23A	Route cut back from Tysons West Park Transit Center to Tysons Corner Center
23C	Eliminated
24T	Not Implemented
28A	Circulation pattern modified within Tysons Corner Center
28B	Not Implemented
28T	Not Implemented
--	As-Built WMATA Route 3A - Annandale to East Falls Church Metrorail Station
--	As-Built WMATA Route 28X - Leesburg Pike Limited Line to Tysons Corner Station Metrorail Station

Fairfax County Connector services in the Project corridor has a reduced coverage and a slight increase in the level of service. Headways are reduced on Routes 505, 551, 552, 553, 554, 557, and 574. Many of these routes are interlined. Efficiencies were built with the Tysons Circulator routes and the allocation of equipment between WFC and Wiehle-Reston East Metrorail Stations. **Table 18** summarizes the specific bus route changes in the Project corridor made by the Fairfax County Connector between Entry to PE and as-built services.

Table 18: Fairfax County Connector Service Changes in the Project Corridor

Fairfax County Connector Route Weekday Service at Entry to PE	Weekday Service Changes at As-Built Conditions
RIBS 1	No Change
RIBS 2	Circulation pattern modified to serve Wiehle-Reston East Metrorail Station and eliminate service to Herndon-Monroe Park-and-Ride Lot
RIBS 3	No Change
RIBS 4a	Ribs 4 not considered a Dulles Corridor Route
RIBS 4b	Not implemented
401/402	Alignment modified through Tysons Corner Center to directly serve the Tysons Corner Metrorail Station
--	422 - Implemented as a Tysons Circulator
--	423 - Implemented as a Tysons Circulator
--	424 - Implemented as a Tysons Circulator
--	463 - Service implemented between Vienna and Tysons Corner Metrorail Stations
504	Eliminated
505	Alignment shortened to serve between Reston Town Center to the Wiehle-Reston East Metrorail Station
507	Implemented as a new bus route - Sunset Hills-Sunrise Valley Circulator
551	Route segment to WFC Metrorail Station eliminated
552	Southbound terminus cut back from WFC Metrorail Station to the Wiehle Reston-East Metrorail Station
553	Alignment re-routed to serve the Wiehle-Reston East Metrorail Station instead of the WFC Station with additional service between the Reston South P&R and the Wiehle station
554	Southbound terminus cut back from WFC Metrorail Station to the Wiehle Reston-East Metrorail Station and interlined with 558
574a	Implemented as 574
574b	Not implemented
585	East/West alignment changed to North/South alignment with eastbound changed from WFC Metrorail Station to northbound Wiehle Reston-East Metrorail Station and westbound Reston South P&R terminals extended to southbound Centreville Road terminus
605	Not included as a Dulles Corridor Route
922	Not implemented
924	Alignment extended from the Herndon-Monroe P&R Lot to the Wiehle-Reston East Metrorail Station
925	Not implemented
926	Alignment extended from the Herndon-Monroe P&R Lot to the Wiehle-Reston East Metrorail Station
927	927 not considered a Dulles Corridor Route
929	Circuitous alignment between Fairfax County Parkway and Centreville Road eliminated and alignment extended from Herndon-Monroe P&R lot to the Wiehle-Reston East Metrorail Station
950	Alignment re-routed to serve the Wiehle-Reston East Metrorail Station instead of the WFC Station
959	Not implemented

980	Alignment re-routed to serve the Wiehle-Reston East Metrorail Station instead of the WFC Station
981	Implemented along with new route 983 with both routes interlined between Dulles Airport and the Wiehle Metrorail Station with alternating 983 service to Udvar-Hazy Center
984	Not implemented
989	Not implemented
Tysons Circulator 1	Implemented as 422, 423 and 424
Tysons Circulator 3	
Tysons Circulator 3	
Tysons Circulator 4	

Since the Loudoun County service did not focus on coverage in the Project corridor, the changes focused on frequency and connectivity by serving Wiehle-Reston East and WFC Metrorail Stations. **Table 19** summarizes the specific bus route changes in the Project corridor made by the Loudoun County Transit between Entry to PE and as-built services.

Table 19: Loudoun County Transit Service Changes in the Project Corridor

Loudoun County Transit Route Weekday Service at Entry to PE	Weekday Service Changes at As-Built Conditions
Purcellville/Leesburg - DC	Implemented as Purcellville/Harmony Commuter Service
Purcellville/Leesburg - Dulles North	
Purcellville/Leesburg/Dulles North - Pentagon	
Cascades - Wiehle-Reston East	Not implemented to Wiehle-Reston East Metrorail Station but rather remained as the Cascade to WFC Metrorail Station
Loudoun 101	Implemented as Peak Period services between Loudoun Station and Wiehle-Reston East Metrorail Station (Runs 925/926)
Loudoun 102	
Loudoun 103*	
MCI/AOL	Implemented as Peak Period services between Loudoun County and Wiehle-Reston East Metrorail Station (Runs 990/992)
7 to 7 on 7	Implemented as Route 70 Leesburg-Sterling and not considered a Dulles Corridor Route
Sterling Connector	Implemented as Route 82 and not considered a Dulles Corridor Route
Dulles North - Town Center	Implemented as Route 87X
Leesburg-Ashburn/772	Not implemented
Dulles North/Old Ox/Town Center	Not implemented
Dulles North/Arcola/Stone Ridge	Not implemented
Brambleton/772/Broadlands	Not Implemented

Additional details on level of service and changes in revenue hours for each bus operator is presented in **Appendix A3**.

4.2.2.2 Comparison of Bus Transit Fare Policies

The fare policies of the transit operators are presented in **Table 20**. There are additional fare discounts with the use of SmarTrip cards which can be used on all buses servicing the Project corridor. The Entry to PE values that were originally in 2004 dollars are escalated to 2016 dollars using the CPI-U index, where the constant dollar ratio in the CPI-U index between 2004 and 2016 are applied to the 2004 dollar values to convert to 2016 constant dollars.

Table 20: Comparison of Planned vs. Actual Transit Operator Fare Policy (in 2016 dollars)

	Entry to PE		Actual or As-Built Year		Δ Percent	
Transit Operator	Regular*	Express*	Regular	Express	Regular	Express
Metrobus	$1.56	$3.26	$1.75	$4.00	12.2%	22.7%
Metrorail to Metrobus Transfer	$0.52 fare discount in each direction		$0.50 fare discount in each direction after 2 hrs., otherwise free			Negligible
Fairfax Connector	$0.98	$3.26	$1.75	$4.00	78.6%	22.7%
Fairfax Connector with Transfer	$0.33	NA	Free up to 2 hours	$4.25	Free	NA
Fairfax Connector to Metrobus Transfer	$0.59	$2.28	All bus-to-bus transfers are free for regular route transfers when using a SmarTrip card. Local-to-express transfers cost $2.05 with a SmarTrip card.		Free for local buses and significant discount for transfers to express buses	
Loudoun County Transit	$0.65	$7.82 to DC, $1.96 to WFC, $1.30 rev. from WFC	$1.00	$9.00 to DC; $2.00 to WFC; $1.00 from WFC	53.8%	15% price change to DC, 2.3% change to WFC, and a 23.3% fare reduction to rev. from Wiehle

**Entry to PE fare policies originally reported in 2004 dollars. These values were escalated to 2016 dollars by applying constant dollar ratio in the CPI-U index between 2004 and 2016*

4.2.3 Accuracy of Predictions and Causes of Differences

While there are differences, the service coverage goals planned during Entry to PE were met with the as-built services implemented in the Project corridor. The most noticeable of these differences are the revisions made by Loudoun County Transit. The Entry to PE service to Loudoun Station Park and Ride Lot was reduced with the implementation of the as-built service.

Assuming a tolerance of 15% change between planned and actual fare, both rail services and regular bus services exceed that tolerance level as shown in Tables X and X, respectively. Rail fares are distance-based and an approximate range of As-Built rail fare extends from $2.00 to $6.00. It should be noted that while the difference for regular bus fare is greater than 15%, the As-Built fare is still less than $2.00.

4.3 Lessons Learned

Both Loudoun and Fairfax Counties held several public participation meetings with their community to review the bus access issues related to Project and identified that the need for effective local and express bus services to Wiehle-Reston East Metrorail Station as an important objective. The as-built bus transit operations meet these objectives described in the Entry to PE plan.

5 OPERATIONS AND MAINTENANCE (O&M) COST

This section documents current operations and maintenance (O&M) costs within the Project corridor and compares it to the O&M costs prior to implementation of service changes associated with the Project. O&M costs are generally available at the systemwide level for transit operators. This information has been disaggregated (when possible) to reflect estimated costs for services specifically operating within the Project corridor. Data reference in this section was obtained from WMATA budget book reports, the National Transit Database (NTD), and other relevant sources. Calculations were conducted using a single variable estimation methodology.

5.1 As-Built O&M Costs for the Project

5.1.1 Metrorail

The WMATA budget book documents estimated railcar miles by rail line for current year and the actual railcar miles for past years. According to the FY2018 WMATA budget book, the Metrorail O&M cost in FY2016 was slightly below $1.0 billion and the O&M unit cost is calculated as $9.74 per railcar revenue mile. **Table 21** summarizes this information.

Table 21: As-Built WMATA Metrorail O&M Cost ($2016)

FY2016 – Total Service	Railcar Miles	Route Cost (@ $9.74 per railcar revenue mile)
Red Line	28,011,000	$272,827,140
Blue Line	13,858,400	$134,980,816
Orange Line	14,368,900	$139,953,086
Yellow Line	10,390,300	$101,201,522
Green Line	12,132,400	$118,169,576
Silver Line	16,447,300	$160,196,702
Regular Revenue Service Miles & Cost	**95,208,300**	**$927,328,842**
Special Revenue Service Miles & Cost	2,557,283	$24,907,936
Total Revenue Service Miles & Cost	**97,765,583**	**$952,236,778**
Non-Revenue Service Miles & Cost	1,600,000	$15,584,000
Total Service Miles & Cost	**99,365,583**	**$967,820,778**

Note: 2018 WMTA Budget Book and the FTA National Transit Database (NTD)

Focusing specifically on the Orange and Silver Lines, the railcar revenue mile number only includes the scheduled revenue service (**Table 22**). The FY2018 budget book reports Orange line and the Silver Line scheduled railcar revenue service miles and the FTA National Transit Database provides the railcar revenue service mile unit costs.

Table 22: As-Built Silver and Orange Line O&M Cost

Metrorail Line/Metric	As-Built ($2016)
Silver Line	
Operating Expenses	$160,196,702
Railcar Revenue Miles	16,447,300
Unit Cost	$9.74
Orange Line	
Operating Expenses	$139,953,086
Railcar Revenue Miles	14,368,900
Unit Cost	$9.74

Note: 2018 WMTA Budget Book and the FTA National Transit Database (NTD)

5.1.2 Other Transit Services

The total annualized O&M cost for bus transit services within the Project corridor was estimated for FY2016 using the NTD data. **Table 23** summarizes this information.

Table 23: As-Built Bus Transit Service O&M Costs (in 2016 dollars)

System	Estimated Operating & Maintenance Cost for Services in Corridor
Metrobus	$31,012,562
Fairfax County	$34,252,953
Loudoun County	$15,738,864

Note: Washington Flyer costs are estimated. Not a public transit service

O&M cost information estimated by route within the Project corridor for each of the operators is provided in **Appendix A4**.

5.2 Comparison of As-Built O&M Cost vs. Prediction

Table 24 summarizes the comparison of O&M cost (in 2016 dollars) of the transit services between those predicted in Entry to PE and those corresponding to As-Built service. The Entry to PE values that were originally in 2004 dollars are escalated to 2016 dollars using the CPI-U index, where the constant dollar ratio in the CPI-U index between 2004 and 2016 are applied to the 2004 dollar values to convert to 2016 constant dollars.

Table 24: Comparison of Entry to PE to As-Built O&M Costs (in 2016 dollars)

Transit Operator	Entry to PE O&M Cost*	As-Built O&M Cost	Δ O&M Cost
Metrorail Silver Line	$134,356,641.85	$160,196,702	$25,840,060
Metrobus	$15,813,646	$31,012,562	$15,198,916
Fairfax County Connector	$25,452,105	$34,252,953	$8,800,848
Loudoun County	$7,718,333	$15,738,864	$8,020,532

**Entry to PE fare policies originally reported in 2004 dollars. These values were escalated to 2016 dollars by applying constant dollar ratio in the CPI-U index between 2004 and 2016*

5.2.1 Accuracy of Predictions and Causes of Differences

Table 25 summarizes the accuracy of O&M cost predictions made during Entry to PE in comparison to the O&M cost of the As-Built services.

Table 25: Accuracy of O&M Cost Prediction at Entry to PE

Transit Operator	Δ in O&M Cost Between Entry to PE and As-Built Services	Accuracy of Prediction in %
Metrorail Silver Line	$25,840,060	16%
Metrobus	$15,198,916	49%
Fairfax County Connector	$8,800,848	26%
Loudoun County	$8,020,532	51%

In general terms the acceptable tolerance of a cost estimate as compared to the actual cost should be within a ± 15%. Compared to the transit bus O&M cost estimate, the Silver Line estimate is closest to the acceptable range at -16%. It is interesting to note that given the difference in scale between rail and bus services the smallest percentage change translates to the largest dollar change. This can be easily attributed to the cost of maintenance components for rail as compared to bus along with the cost of living within each jurisdiction. The most visible cause of the rail cost increase is the extension of the Silver Line terminus from Stadium/Armory in the District of Columbia, at Entry to PE, to a modified location of New Carrolton in Maryland under As-Built conditions. This change in terminus resulted in greater distance and higher operational and maintenance cost.

The transit bus O&M cost increase is likely attributed to the increased level of service provided upon Silver Line implementation as compared to what was anticipated during Entry to PE. Additionally, there were rising specialty labor costs between the two periods. The As-Built bus services are increase for all three transit bus operators with the situation being particularly acute in Loudoun County where the local bus service was absorbed by the county although the cost is subsidized by federal operating assistance.

5.3 Lessons Learned

There were no significant lessons learned as there are typically several changes in the design of transit systems when comparing what was developed at PE as compared to final implemented system. The most significant issues related to the Silver Line is the required extension of service to New Carrolton due to capacity and turn-around issues and the unanticipated Rush-Plus Program. As for as bus services the most significant event is the taking on of local bus service by Loudoun County Transit and the additional local and express services to the Wiehle Reston-East Station.

6 RIDERSHIP

This section documents the changes in transit ridership patterns within the Project corridor and on the greater Metrorail network after the implementation of Silver Line Phase 1. The comparison of conditions before and after the implementation of Silver Line Phase 1 is used to evaluate the effects of the Project on transit travel behavior and transit system performance within the Project corridor.

Data used in this section was obtained from Metrorail faregate activity reports from May 2012 and May 2016, on-board surveys of Metrorail users conducted in April/June 2012 and Summer 2016, bus intercept surveys conducted in November 2013 and May 2016, and SmarTrip transactions logs from April 2012 and May 2016. The surveys included a wide variety of questions to obtain information about trip and rider characteristics, including place of residence, mode of access, trip purpose, and demographics.

The Project primarily serves transit riders originating from or destined to Fairfax County, Loudoun County, and Dulles Airport. It enhances connectivity between these areas and the greater WMATA transit system, including Washington, D.C.

The Metrorail system has 91 stations with the implementation of Phase 1. Given the large number of stations, to better depict the effects of the Project on systemwide ridership patterns, the Metrorail stations were grouped into 10 station groupings. The station groupings are shown in **Figure 6-1** and **Table 26**.

Figure 6-1: Metrorail Station Groupings

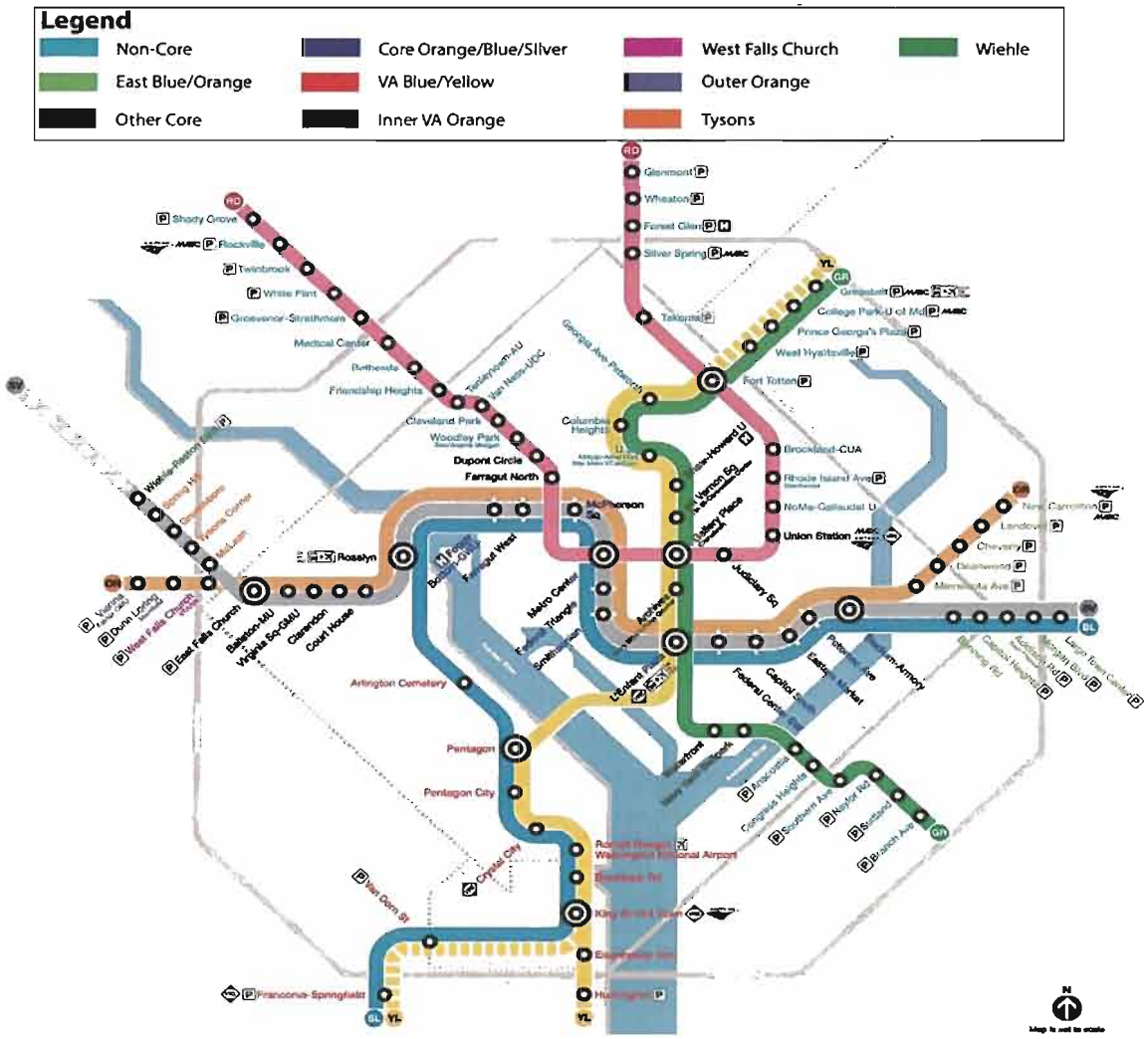


Table 26: Station Groupings

Group		Stations
1	Wiehle	Wiehle-Reston East
2	Tysons	Spring Hill, Greensboro, Tysons Corner, McLean
3	Outer VA Orange	Vienna, Dunn Loring
4	WFC	West Falls Church
5	Inner VA Orange	East Falls Church, Ballston, Virginia Square GMU, Clarendon, Court House
6	VA Blue/Yellow	Franconia-Springfield, Van Dorn Street, King Street, Braddock Road, National Airport, Crystal City, Pentagon City, Pentagon, Arlington Cemetery, Eisenhower Avenue, Huntington
7	Core Orange/Blue/Silver	Rosslyn, Foggy Bottom GWU, Farragut West, McPherson Square, Metro Center, Federal Triangle, Smithsonian, L'Enfant Plaza, Federal Center SW, Capitol South, Eastern Market, Potomac Avenue, Stadium Armory
8	Other Core	Farragut North, Dupont Circle, Gallery Place, Judiciary Square, Union Station, Archives-Navy Mem, Mt Vernon Square, Shaw Howard U, Waterfront, Navy Yard
9	East Blue/Orange	Benning Road, Capitol Heights, Addison Road, Morgan Blvd, Largo Town Center, Minnesota Ave, Deanwood, Cheverly, Landover, New Carrollton
10	Non-Core	Woodley Park Zoo, Cleveland Park, Van Ness UDC, Tenleytown, Friendship Hts, Bethesda, Medical Center, Grosvenor, White Flint, Twinbrook, Rockville, Shady Grove, NoMa-Gallaudet U (New York Ave), Rhode Island Avenue, Brookland CUA, Fort Totten, Takoma, Silver Spring, Forest Glen, Glenmont, Southern Avenue, Naylor Rd, Suitland, Branch Avenue

6.1 As-Built Ridership of the Project

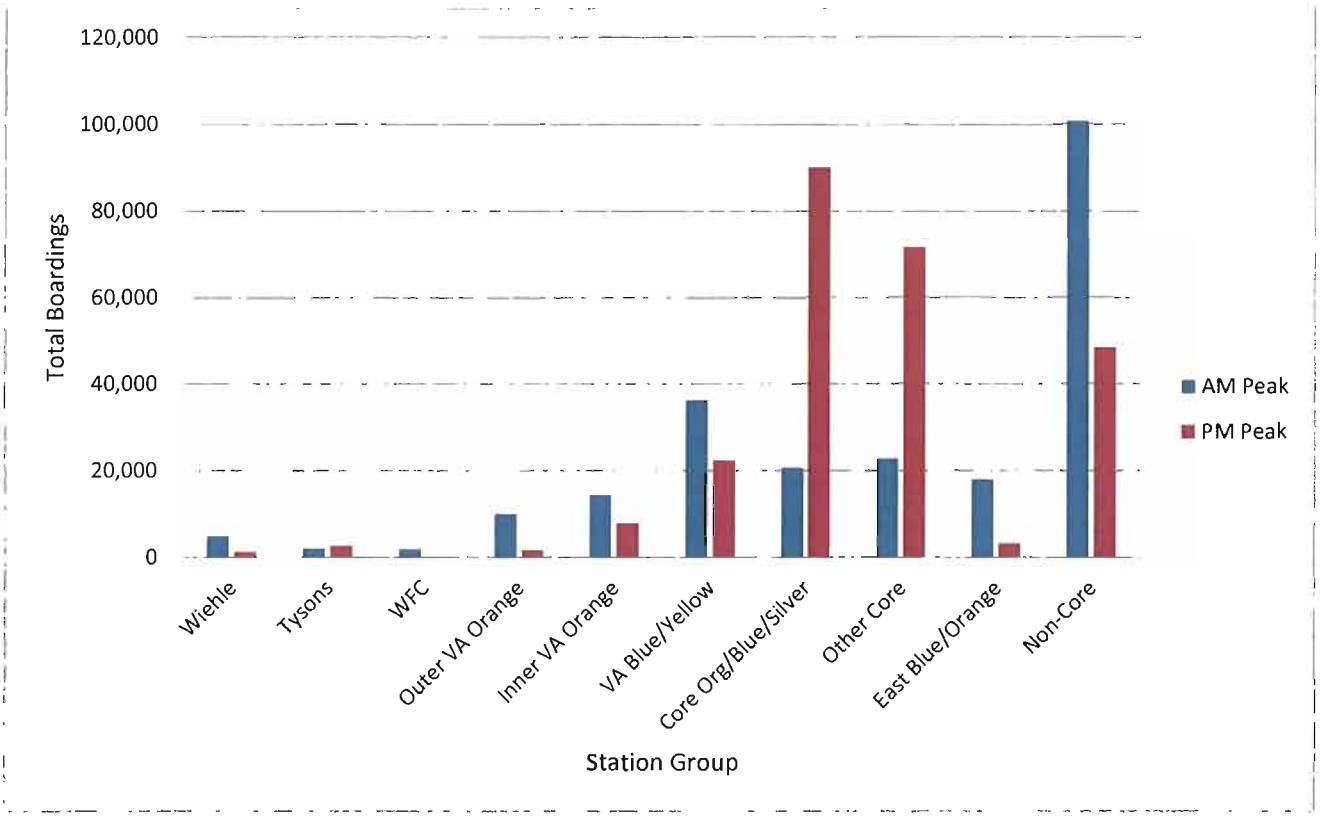
The as-built or after conditions ridership of the Project was based on 2016 ridership data as described earlier.

Metrorail ridership after the opening of the Project was tabulated by station grouping and is shown in **Table 27** and **Figure 6-2**. Additional ridership for the as-built or the after conditions are included in **Appendix A5**.

Table 27: Metrorail Boardings (May 2016)

Station Group		AM Peak Period	PM Peak Period	Daily
1	Wiehle	4,962	1,334	7,794
2	Tysons	2,119	2,837	7,173
3	WFC	1,984	266	2,833
4	Outer VA Orange	10,156	1,731	14,713
5	Inner VA Orange	14,506	7,895	19,898
6	VA Blue/Yellow	36,167	22,369	81,122
7	Core Orange/Blue/Silver	20,726	90,012	159,403
8	Other Core	22,764	71,528	141,117
9	East Blue/Orange	18,026	3,358	27,910
10	Non-Core	100,631	48,324	204,964
Systemwide		**232,041**	**249,653**	**676,927**

Figure 6-2: Metrorail Station Boardings by Peak Period (May 2016)



6.2 Comparison of As-Built Ridership vs. Prediction

6.2.1 Ridership "Headwinds"

Metrorail ridership in the before and after (as-built) conditions was tabulated by station grouping and is shown in **Table 28**. The ridership conditions represent Spring 2012, approximately two years before project implementation and after conditions represent Spring 2016 conditions, approximately two years after project opening.

Table 28: Before and After Boardings by Station Group: Daily

	Station Group	AM Peak Period		PM Peak Period		Daily	
		Before	After	Before	After	Before	After
1	Wiehle	0	4,962	0	1,334	0	7,794
2	Tysons	0	2,119	0	2,837	0	7,173
3	WFC	7,076	1,984	1,931	266	11,106	2,833
4	Outer VA Orange	12,868	10,156	2,856	1,731	19,125	14,713
5	Inner VA Orange	14,150	14,506	9,774	7,895	32,802	29,898
6	VA Blue/Yellow	39,509	36,167	26,914	22,369	92,533	81,122
7	Core Org/Blue/Silver	22,606	20,726	100,250	90,012	183,940	159,403
8	Other Core	23,080	22,764	69,321	71,528	151,520	141,117
9	East Blue/Orange	21,421	18,026	4,873	3,358	34,911	27,910
10	Non-Core	104,416	100,631	53,529	48,324	229,015	204,964
	Systemwide	**245,126**	**232,041**	**269,448**	**249,653**	**754,952**	**676,927**

As can be determined from **Table 28**, there was a broadly distributed decrease in Metrorail ridership; all station groups other than those including Silver Line stations observed a decrease in ridership by 2016. This systemwide decrease in ridership can be attributed to various factors unrelated to the Project, including those that subsequently led to the systemwide SafeTrack rehabilitation program that began in mid-2016. This created a ridership "headwind" that disguises the true effect of the Project on transit ridership.

The systemwide transit headwind was not predicted by project travel demand forecasts prepared during project development and thus makes the comparison of projected project activity and actual project activity challenging. By adjusting ridership data to control for the effects of the headwind, the true effect of the project can be isolated, and compared against previous forecasts.

To estimate the ridership increases that would have theoretically occurred without this headwind, a multi-step process was undertaken. The first step was to subtract the change in project-related trips (production or attraction trips involving the Wiehle, Tysons, Outer VA Orange, and WFC groups) from the After conditions system trip total. An adjustment factor was then calculated to scale the 2016 trips

on the portion of the system unaffected by the Project total up to match the trip totals on the same portion of the system in 2012. Project-related trips in the After conditions were then scaled up by this factor and used to calculate the theoretical change in project-related trips. This process was iterated until the non-project-related before trip totals approximately matched the non-project-related after trip totals, and a final adjustment factor reached. reflects the effect of the headwind adjustment. A more detailed breakdown of how this adjustment was calculated is shown in **Appendix A5.2**. Using this methodology, it was determined that the effect of the Project is an increase in ridership by approximately 12,000 riders. After conditions ridership numbers discussed in the following sections reflect numbers that have been adjusted to account for the headwind.

Table 29: Derivation of Adjustment Factor to Remove "Headwind" Effects

Metric	Without Headwind Adjustment			With Headwind Adjustment	
	Before	After	After Excluding Project Effect	After	Less Proj Net Effect
Total system entries	754,756	667,224	665,096	766,407	754,756
Project-associated changes	**Before**	**After**	**Delta**	**After**	**Delta**
Project Productions	0	18,698	18,698	21,546	21,546
Project Attractions	0	10,790	10,790	12,434	12,434
Trips Internal to Project	0	1,604	-1,604	1,848	-1,848
Outer VA Orange Productions	31,366	24,769	-6,597	28,542	-2,824
Outer VA Orange Attractions	6,636	4,239	-2,397	4,884	-1,752
West Falls Church Productions	17,748	4,908	-12,840	5,656	-12,092
West Falls Church Attractions	4,645	724	-3,922	834	-3,812
Net effect of the project	60,396	65,732	2,128	13,222	11,652
Trips on the project itself	---	27,884	---	32,131	---

Overall adjusment factor		
766,407 / 667,224	=	**1.14865**

6.2.2 Changes in Ridership Patterns

Both the on-board survey data and faregate data were used to assess the changes in ridership patterns that occurred between before and after conditions.

Metrorail ridership was impacted primarily by changes in transit service. Several changes to transit service occurred in the Project corridor, in part due to the project and in part due to other factors. The primary change was the introduction of rail service in the Dulles corridor replacing the many trunk bus

services that were previously serving the WFC Metrorail Station. The service on the Silver Line in the after conditions consisted of 6-minute peak headways and 12-minute off-peak headways.

In addition to rail service changes, bus service in the Project Corridor also changed between before and after conditions. Prior to the commencement of Silver Line service, local transit agencies provided trunk bus service in the Project corridor which served the WFC Metrorail Station, providing access to the Metrorail system for passengers in the corridor. After the commencement of Silver Line service, many of the bus routes which served WFC Metrorail Station were rerouted, canceled, or replaced with new routes serving one of the five new Silver Line stations.

6.2.2.1 Ridership on the Project

Headwind-adjusted ridership after the opening of the Project was tabulated by station group and is shown in **Table 30**; Silver Line stations are broken out individually. These numbers reflect ridership adjusted for the headwind discussed previously. The Wiehle-Reston East Metrorail Station and the four Tysons stations combined have approximately the same ridership, with 8,953 and 8,240 daily boardings, respectively. The 3,254 boardings at WFC Metrorail Station represents a significant decrease in ridership from the 11,106 daily boardings at that station in before conditions. While some of this decrease can be ascribed to the ridership headwinds discussed previously, a significant portion could be attributed to effects from the Project, such as riders shifting their origin station to a Silver Line station. The effects of the Project on ridership at WFC Metrorail Station are discussed in detail later in this report.

Table 30: Boardings by Station – After Conditions (With Headwind Adjustment)

Station Group	AM Peak Period	PM Peak Period	Daily
Wiehle-Reston East	5,700	1,532	8,953
Spring Hill	519	488	1,435
Greensboro	384	579	1,342
Tysons Corner	673	1,544	3,567
McLean	859	648	1,896
Subtotal - Silver Line	***8,134***	***4,791***	***17,191***
West Falls Church	2,279	306	3,254
Outer VA Orange	11,666	1,988	16,900
Inner VA Orange	16,662	9,069	34,342
VA Blue/Yellow	41,543	25,694	93,181
Core Org/Blue/Silver	23,807	103,392	183,098
Other Core	26,148	82,161	162,094
East Blue/Orange	20,706	3,857	32,059
Non-Core	115,590	55,507	235,432
Systemwide	***266,534***	***286,764***	***777,552***

Table 31 shows the station-group to station-group ridership data (headwind-adjusted) for the Silver Line stations. Detailed tabulations of station-group to station-group trip patterns broken out by trip type, mode of access, income level, and vehicle ownership are provided in **Appendix A5.3** (for headwind-adjusted data) and **Appendix A5.4** (for headwind-unadjusted data). The Wiehle-Reston East Metrorail Station stands out as primarily a trip producer – a station which has significantly more trip productions than attractions. The Spring Hill, Greensboro, and McLean stations have approximately the same

number of trip productions and attractions. The Tysons Corner Metrorail Station is primarily a trip attractor – it has significantly more trip attractions than productions.

The following subsections discusses the principal travel markets on the Project and key characteristics of those travel markets.

Table 31: Silver Line Station-Group to Station-Group Trips (Headwind-Adjusted)

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
2	Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
3	Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
4	Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
5	McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
6	Outer VA OR	101	20	18	112	48									299
7	WFC	18	5	0	14	1									38
8	Inner VA OR	768	247	410	1,054	300									2,780
9	VA BL/Yellow	186	110	93	227	78									694
10	Core OR/BL/SL	903	281	350	1,128	336									2,997
11	Other Core	337	68	112	283	85									885
12	East BL & OR	205	56	70	334	59									723
13	Non-Core	623	227	255	758	273									2,135
	Total	3,546	1,349	1,520	4,549	1,431	163	19	2,068	1,316	11,615	3,157	123	1,174	32,029

6.2.2.1.1 Trip Production at Wiehle-Reston East Station

Wiehle-Reston East Metrorail Station generates most of the production trips (14,100) from the Project. Of these trips, 10,100 are to the D.C. core, 900 are to the four Tysons Corner Stations, 2,300 are to the rest of northern Virginia, and 700 are to other non-core stations. Trips to the D.C. core are predominantly home-based work, with a higher percentage of those trips being home-based work (81 percent) than the Project as a whole (69 percent).

Trips from Wiehle to Tysons are similar in purpose to trips to other stations, except that Wiehle-to-Tysons trips are slightly more weighted toward home-based-other trips (21 percent) than the fraction of home-based-other trips to all locations (12 percent).

Of riders with productions at Wiehle, 33 percent access the station by bus; this is much higher than any other Silver Line station, and 81 percent of the total bus access trips to the Silver Line are at Wiehle. The most common mode of access at Wiehle is park-and-ride (44 percent).

Trip productions at Wiehle are overweighted to highest income bracket (>$100k). Riders making more than $100k per year represents 67 percent of all productions at Wiehle, compared to 54 percent of trips on the Project as a whole. Only 5 percent of riders with productions at Wiehle do not have access to a car; this is significantly lower than the systemwide average of 19 percent.

In looking at residence-based data, the areas surrounding Wiehle saw the largest drops in riders accessing Metrorail via bus. This is likely due to a) new Silver Line stations being closer to residents and changing their preferred mode of access or b) changes in bus service to the WFC Metrorail Station.

6.2.2.1.2 Trip Production at Tysons Stations

The four Tysons stations combined generate 6,400 trip productions to the rest of the Metrorail system. Of these trips, 4,700 are to the D.C. core, 1,300 are to northern Virginia, and 400 are to non-core stations. Home-based work trips from these stations represents a lower fraction of all trips (57 percent) than the Project as a whole (69 percent); non-home-based trips from these stations (28 percent) are higher than the average for the Project (18 percent).

Trip productions from the Tysons stations have a slightly higher rate of riders walking to the stations (37 percent) than trips on the Project as a whole (30 percent); this trend remains consistent regardless of where riders are going. Bus access activity is minimal – only 14% percent of production trips are accessed via bus.

In looking an income-level data, income levels of riders with productions at the four Tysons stations was generally consistent with the Project-wide average, with over 50 percent having an income of over $100,000 per year.

In looking at residence-based data, the primary station of access for Metrorail riders living south of the Toll Road near Tysons Corner was either Vienna or Dunn Loring in the before conditions; in the after conditions, riders in these areas converted to the Spring Hill, Greensboro, or McLean stations.

6.2.2.1.3 "Reverse Commute" Activity to Tysons

The four Tysons Corner stations attract over 8,800 trips daily. Both the Greensboro and Tysons Corner Metrorail Stations are primarily trip-destination stations; more people ride to these stations than from them. Among these trips, 37 percent come from other northern Virginia stations, 36 percent come from the DC core, and 27 percent come from other non-core stations.

Among the low-income users of the Project, most are going to the Project as opposed to coming from those stations. Of the trips going to the Project, 23 percent were in the lowest surveyed income bracket (less than $50k per year), compared to 16 percent of all riders on the Project. Similarly, 39 percent of riders to the Project have no access to a car, versus 19 percent of trips on the Project as a whole.

Walking is the predominant mode of egress at all Project stations, except for Tysons Corner, where 27 percent walk, 27 percent take the bus, and 39 percent utilize some other form of egress.

For home-based work trips to Tysons, the most common origin stations are in Arlington or central Washington, D.C.

6.2.2.1.4 "Reverse Commute" Activity to Wiehle

The Wiehle-Reston East Metrorail Station attracts over 3,500 trips daily. Among these trips, 35 percent come from the DC core, 30 percent come from northern Virginia, and 10 percent come from the Tysons stations. Home-based work trips comprise 64 percent of trips to Wiehle, which is slightly lower than the average for the Project as a whole (69 percent); 25 percent of trips to Wiehle are non-home-based.

Of the trip attractions to Wiehle, 23 percent are low-income (<$50k), compared to 16 percent of riders on the Project as a whole. Only 39 percent of attraction trips have riders in the highest income bracket, much lower than the project as a whole (54 percent).

Among riders going to Wiehle, 30 percent have no access to a car, versus 19% of trips on the Project as a whole.

6.2.2.1.5 Minimal Circulation within Tysons

The station-to-station ridership data shows that there are few internal trips within the Project. Among these trips, the predominant movement is from Wiehle to the four Tysons stations. The largest individual production-attraction station pair among internal Tysons trips is Tysons Corner to Spring Hill (15 percent of internal trips). Internal trips within the project are predominantly non-home-based (75 percent of all trips).

6.2.2.2 Effects of the Project on Metrorail Ridership Patterns

Tables with comparisons of headwind-adjusted station-group-to-station-group ridership data are provided in **Appendix A5.3**. **Appendix A5.4** includes the same information, but without headwind adjustments. Stations in the Tysons station group are broken out into individual stations to provide more detail on ridership patterns at those locations. These include station group production-attraction travel patterns broken down by time of day, trip purpose, access mode, income, and vehicle ownership.

This section discusses key findings in the station-group-to-station-group ridership patterns from the headwind-adjusted data.

6.2.2.2.1 Increase in Ridership in the Project Corridor

A total of 21,500 daily trip productions were generated from the five Silver Line Stations (Wiehle-Reston East Metrorail Station plus the four Tysons stations) in after conditions. Trip productions at a station are trips where the station is closest to the home end of the trip (either boarding or alighting). The majority of these were home-based work trips (70 percent); the remainder were non-home-based (16 percent) or home-based other (13 percent). Of the 12,400 daily trip attractions to these five stations, 65 percent were home-based work trips, 12 percent were home-based-other, and 24 percent were non-home-based. Trip attractions at a station are trips where the station is closest to the destination end of the trip (either boarding or alighting).

There are more production trips on the Silver Line than attraction trips (i.e., Silver Line stations are more frequently associated with the home end of the trip rather than the destination end); most of the

production trips are commuters. Attraction trips to the Silver Line stations are also mostly commuters; however, a greater portion of the attraction trips are non-home-based, reflective of shopping and recreation-related trips headed to Tysons Corner.

6.2.2.2.2 Decrease in Ridership at West Falls Church

A significant decrease in ridership was observed at the WFC Metrorail Station. Totals of 17,700 daily trip productions and 4,600 daily trip attractions in the before conditions were reduced to 5,600 trip productions and 800 trip attractions. This decrease could be attributed in great part to the bus service changes that occurred after the initiation of Silver Line service and a general shift in ridership to the new Silver Line stations; in the after conditions, trip productions where the station was accessed by bus decreased by 8,100 trips, or 91 percent. The fact that bus ridership dropped so significantly is reflective of the changes in bus service which resulted in significantly fewer routes serving the WFC Metrorail Station, with those routes instead serving the Silver Line. Within the decrease in production trips, 83 percent of the lost trips were home-based work trips. Within the decrease in attraction trips, 73 percent of the lost trips were home-based work trips.

Additionally, there was a 43 percent decrease in park & ride trips at West Falls Church. In before conditions, the WFC Metrorail Station was a major access point for the Metrorail system for residents in the Project corridor, as it is easily accessible via the Dulles Toll Road. The decrease could be attributed to riders who previously accessed the West Falls Church station via park & ride electing to drive to Wiehle-Reston East Metrorail Station instead. The fact that the decrease is less pronounced than the decrease for bus riders is reflective of the fact that park & ride users living near the WFC Metrorail Station could continue to use the station, whereas the changes in bus routing affected the vast majority of users accessing the station via bus.

6.2.2.2.3 Net Increase in Ridership from Outer Northern Virginia Stations

Among all Metro stations in outer Northern Virginia, including the five Silver Line stations plus Vienna, Dunn Loring, and West Falls Church, there was a net increase in trip productions (+4,800) and in trip attractions (+5,200) to and from the rest of the Metrorail system. This is primarily reflective of the fact that rail service was increased in this area with the initiation of Silver Line service.

A notable trend within the increase in trip productions was the increase in trips accessing stations by walking (+4,500) and the decrease in trips accessing stations by bus (-4,800). The Silver Line stations—particularly Wiehle, Tysons Corner, and McLean—largely contributed to this increase in trips accessed by walking; this corresponds to the higher densities and greater pedestrian infrastructure at these stations. The decrease in bus access trips is primarily due to the loss in bus trips at West Falls Church not being balanced by a corresponding increase in bus access trips at Silver Line stations, where much of the bus routes previously serving West Falls Church were redirected. This disparity can be attributed to a) riders who previously accessed West Falls Church via bus accessing a station closer to their residence via different modes (e.g. a rider who used to ride a bus from Reston to West Falls Church electing to walk to

Wiehle-Reston East after the Silver Line opening) or b) social and demographic trends causing a general decrease in bus ridership.

6.2.2.2.4 Impacts of Service Reduction for Outer Orange Line Stations

Prior to the initiation of Silver Line service, outer Orange Line stations (Vienna, Dunn Loring, and West Falls Church) were served by 6-minute peak headways and 12-minute off-peak headways on Metrorail; additional "tripper" trains are also provided during the peak periods in the peak direction, effectively reducing the headways in the peak period and direction to 3.5 minutes. The "tripper" trains were eliminated to accommodate Silver Line trains on shared tracks.

Among the outer Orange Line stations, there was an observed decrease in daily trip productions (-15,000 trips or -31 percent) and in daily trip attractions (-5,600 trips or -50 percent). West Falls Church was the primary contributor to these decreases (-12,100 trip productions and -3,800 trip attractions). The decrease in rail service frequency, combined with the opening of the Silver Line displacing some of the preexisting Orange Line ridership, contributed to these decreases.

6.2.2.2.5 Combined Headway Effects on Inner VA Orange Stations

The branches of the Silver and Orange Lines in outer Northern Virginia converge between the East and West Falls Church stations. With 6-minute peak headways and 12-minute off-peak headways on each line, these lines combine to create 3-minute peak headways and 6-minute off-peak headways east of the East Falls Church station. Before the Silver Line, the Inner VA Orange stations were served only by 6-minute peak headways and 12-minute off-peak headways, with an effective 3.5-minute peak headway provided in the peak direction resulting from the "tripper" trains.

Ridership data reflects an increase (+2,300 trips or +7 percent) in production trips from Inner VA Orange to stations in the Metrorail system core, but no change in the reverse. There were no discernable changes in trip types between the before and after conditions, suggesting there was a general increase in ridership that could be attributed to a generally higher level of rail service at the Inner VA Orange stations.

6.2.2.2.6 Effects of Blue Line Trains being Rerouted to Yellow Line Tunnel

In order to accommodate the greater volume of trains utilizing the Blue/Orange Line tunnel between Rosslyn and Foggy Bottom with the additional Silver Line trains, some peak period Blue Line trains from Franconia-Springfield were shifted to use the 14th Street Bridge directly to L'Enfant Plaza as Yellow Line trains instead of routing through Rosslyn station. This resulted in increases in trip flows between the VA Blue/Yellow and Other Core station groups (+3,500 production trips from VA Blue/Yellow to Other Core and +1,100 attraction trips for the reverse). Almost all the observed increase was in commuter trips, indicative of commuters taking advantage of the more direct service into the central business district.

6.2.2.3 Residence-to-Station Ridership Patterns

The on-board rail survey collected information on the zip codes of residence for Metrorail riders. These zip codes were then aggregated into various zones; **Figure 6-3** depicts these zones. **Figure 6-4** shows the changes in total Metrorail ridership by zone of residence for passengers who access stations of interest (Silver Line stations plus Vienna, Dunn Loring, and West Falls Church) from their residence. **Figure 6-5** and **Figure 6-6** provide a visualization of ridership at stations of interest for before and after conditions, respectively. **Figure 6-7** represents the changes in these ridership levels between before and after conditions. Ridership levels represented in these figures do not include headwind adjustments for after conditions.

Additional tables disaggregating ridership levels by trip type and mode of access are provided in **Appendix A5.5 and A5.7**. Ridership levels in these tables include headwind adjustments for after conditions. This section discusses key findings in the residence-to-station ridership patterns in the headwind-adjusted data.

6.2.2.3.1 Ridership Shifts in Herndon/Reston, Sterling, and Great Falls

Most areas saw decreases in Orange Line ridership; some of these decreases, particularly those in zones that are not near the Project, can be attributed to the systemwide "headwinds" discussed previously. The zones nearest the new Silver Line stations saw shifts in ridership from Orange Line to Silver Line. In before conditions, residents in Herndon/Reston, Sterling, and Great Falls were primarily accessing the Metrorail system at West Falls Church Metrorail Station, with some others accessing at Vienna and Dunn Loring Metrorail Stations. In after conditions, riders in these areas primarily accessed the Wiehle-Reston East Metrorail Station. The number of riders from these areas increased from 9,300 to 13,600, indicating that Silver Line ridership in these areas was driven by a mix of new riders and preexisting Metro riders shifting to a station closer to home.

6.2.2.3.2 Ridership Shifts in the Tysons Area

In before conditions, 2,200 residents in the Tysons area accessed the Metrorail system via Orange Line stations, primarily at West Falls Church. In after conditions, the number of riders in Tysons jumped to 3,700, with 2,600 of those riders accessing the system via the four Silver Line stations in Tysons Corner. For the residents accessing stations in Tysons, 46 percent did so by walking.

6.2.2.3.3 Ridership Shifts Away from Orange Line

A combination of a reduction in rail service levels (associated with elimination of the "tripper" trains) and the ridership headwinds discussed previously may have contributed to decreases in Metrorail ridership for residents near the Outer Orange Line stations.

In the North Falls Church/McLean area, overall ridership dropped from 5,800 riders to 5,000 riders in after conditions. Most of the riders in this area accessed the West Falls Church station. The loss in park & riders was responsible for 88 percent of the decrease in overall ridership in this area. These trends suggest that choice riders who previously utilized the West Falls Church park & ride elected to not use Metrorail because of the service reduction or other ridership headwind factors.

6.2.2.3.4 Steady Ridership Levels in South Falls Church

Residents in the South Falls Church area primarily access Metrorail via the East Falls Church Metrorail Station; however, a slight drop in ridership (from 1,100 riders to 900) was observed for those residents accessing either the Dunn Loring or West Falls Church Metrorail Stations from this area. Similar to the North Falls Church/McLean area, a reduction in park & rider users account for most of the ridership decrease, suggesting a loss of choice riders to due service reduction or other ridership headwind factors.

6.2.2.3.5 Shifts in Bus Access Ridership in Centreville, Chantilly, and Prince William County

In before conditions, 5,600 residents accessing Metro from Centreville, Chantilly, and Prince William County primarily accessed the Vienna (85 percent of residents) and West Falls Church Metrorail Stations (15 percent). Over 95 percent of those accessing the West Falls Church Metrorail Station did so by bus. In after conditions, 5,000 residents accessed the Metrorail system as a whole. Almost all trips to West Falls Church were eliminated, reflecting the changes in bus routes to serve the new Silver Line stations instead of West Falls Church. At the Silver Line stations, 350 new trips were generated to Wiehle and 400 new trips were generated to the four Tysons area stations. Overall, a 30 percent decrease in bus riders was observed among the residents in the area, suggesting that the bus service changes and other ridership headwind factors may have contributed to the ridership decrease.

6.2.2.3.6 Decrease in Outer Orange Line Ridership Among Fairfax Area Residents

The 3,800 metro riders in the Fairfax area in before conditions primarily accessed Metrorail at the Vienna station (94 percent of riders). This number dropped to 3,600 in after conditions, with a negligible number of riders going to Silver Line stations. Most of the ridership losses can be accounted for in a 400-rider decrease in bus riders to Vienna.

6.2.2.3.7 Overall Trends

Figure 6-8 depicts the "new" and "shifted" trips by residential zone that were calculated by assuming that former Orange Line riders in these areas shifted to the Silver Line, then subtracting those riders from Silver Line ridership totals to determine the number of new riders.

As previously presented, after adjusting for the headwind, 64 percent of trips at Project stations are trips that shifted from Orange Line stations, and 36 percent of trips are trips that were not previously made via Metrorail. The areas with the greatest number of new Metrorail trips were those near Tysons Corner and areas of north of the Toll Road. As expected, areas along the Project corridor, but closer to the Orange Line, saw a greater ratio of riders who shifted from the Orange Line to Silver Line.

In addition to assessing changes in ridership, on-board rail survey data was used to determine the catchment areas of each station, i.e. the station most used among the riders living in each traffic analysis zone (TAZ). TAZs are a geographic area used for travel demand modeling purposes, and are often smaller areas than zip codes, allowing a more detailed level of analysis. **Figure 6-9** and **Figure 6-10** depict the primary station of access for each TAZ in the Project area. The most significant trend in this data is that most of the riders near the Project in the before conditions accessed the system via the West Falls Church station. Another notable trend in the after conditions data is that for most of the TAZs surrounding Tysons Corner, the primary station of access is not Tysons Corner; in most areas, residents access the system via the Spring Hill, Greensboro, or McLean stations.

Figure 6-3: Zip Code Zones

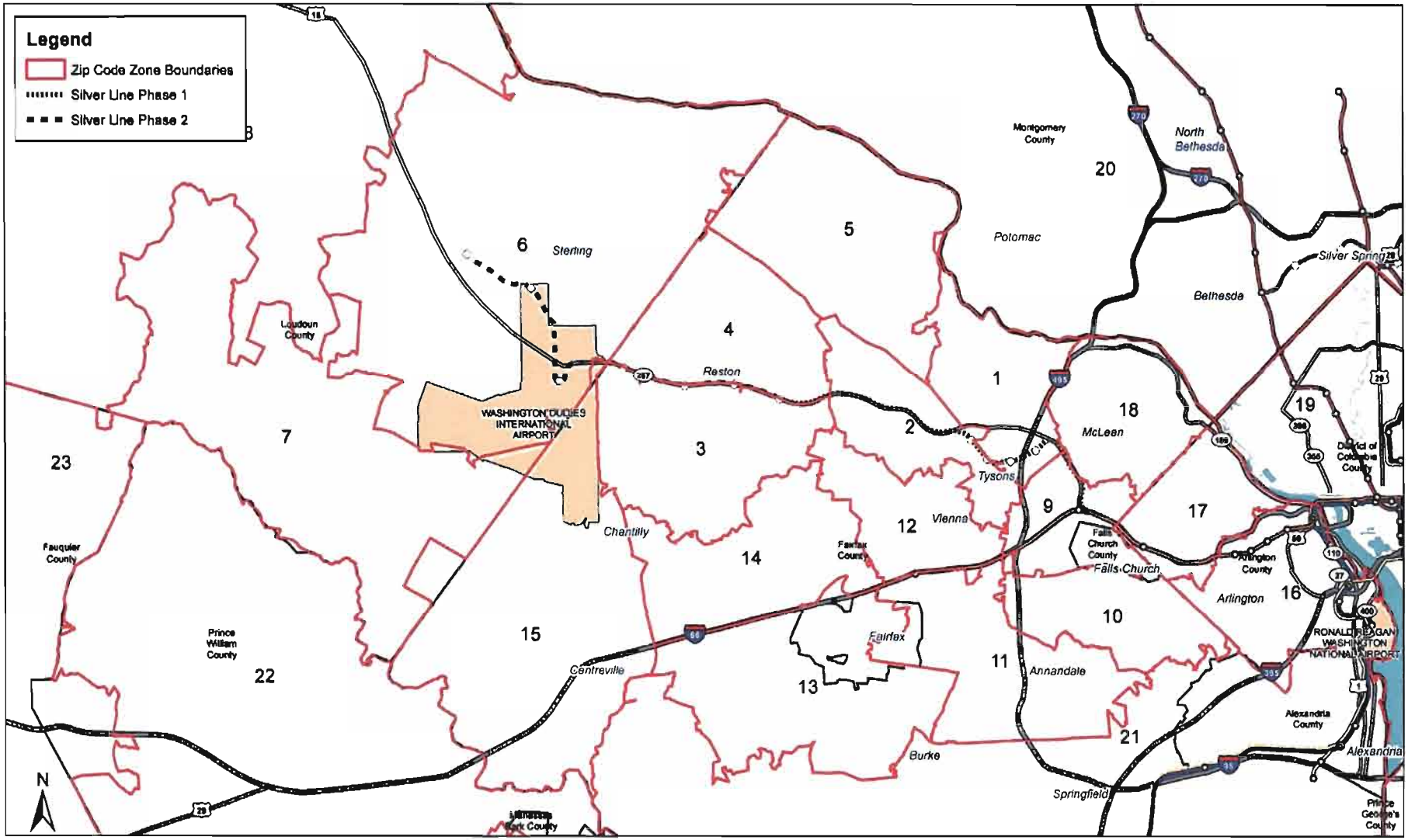


Figure 6-4: Zip Code of Place of Residence to Origin Station – Overall Comparison of Before and After Conditions

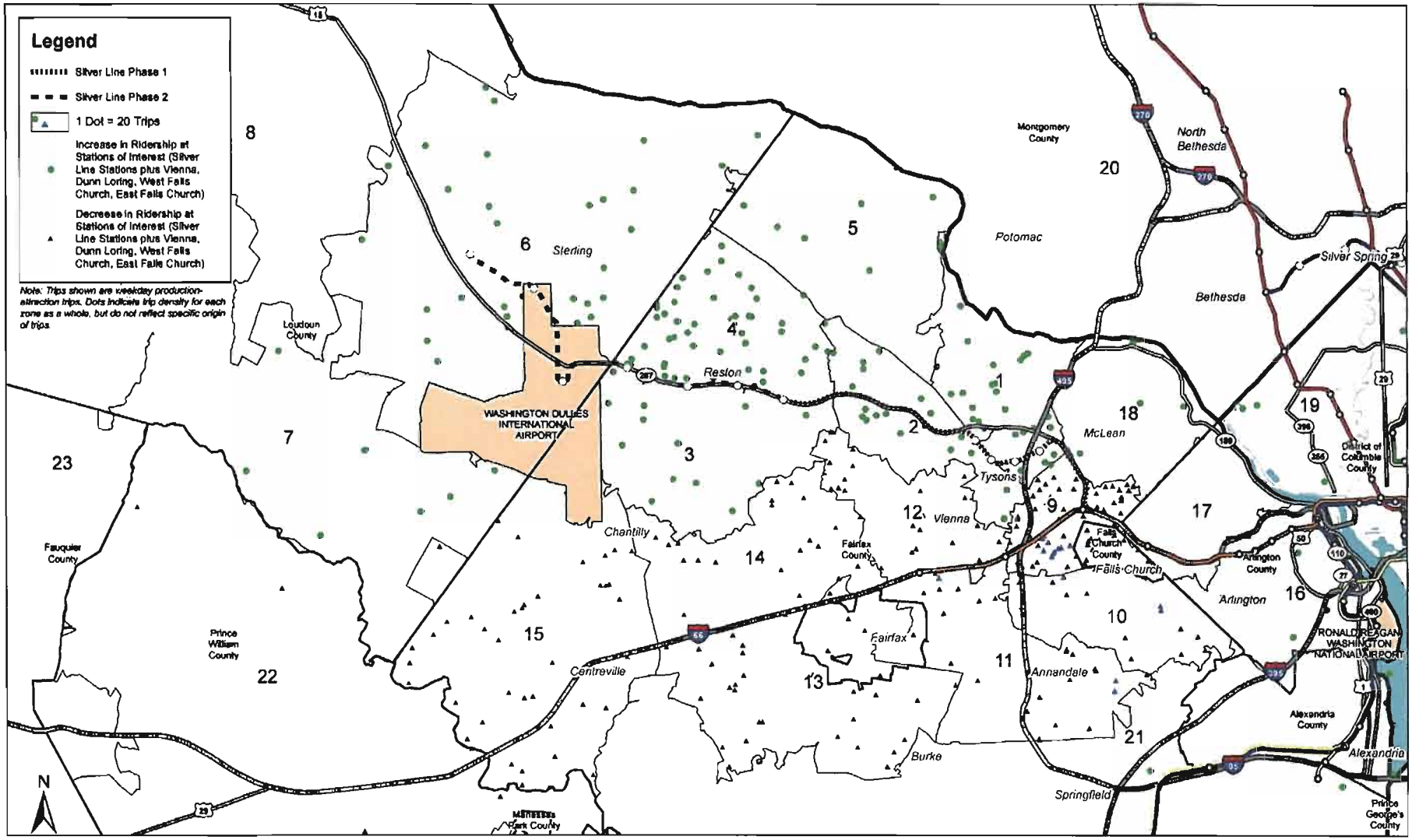


Figure 6-5: Zip Code of Place of Residence to Origin Station - Before Conditions

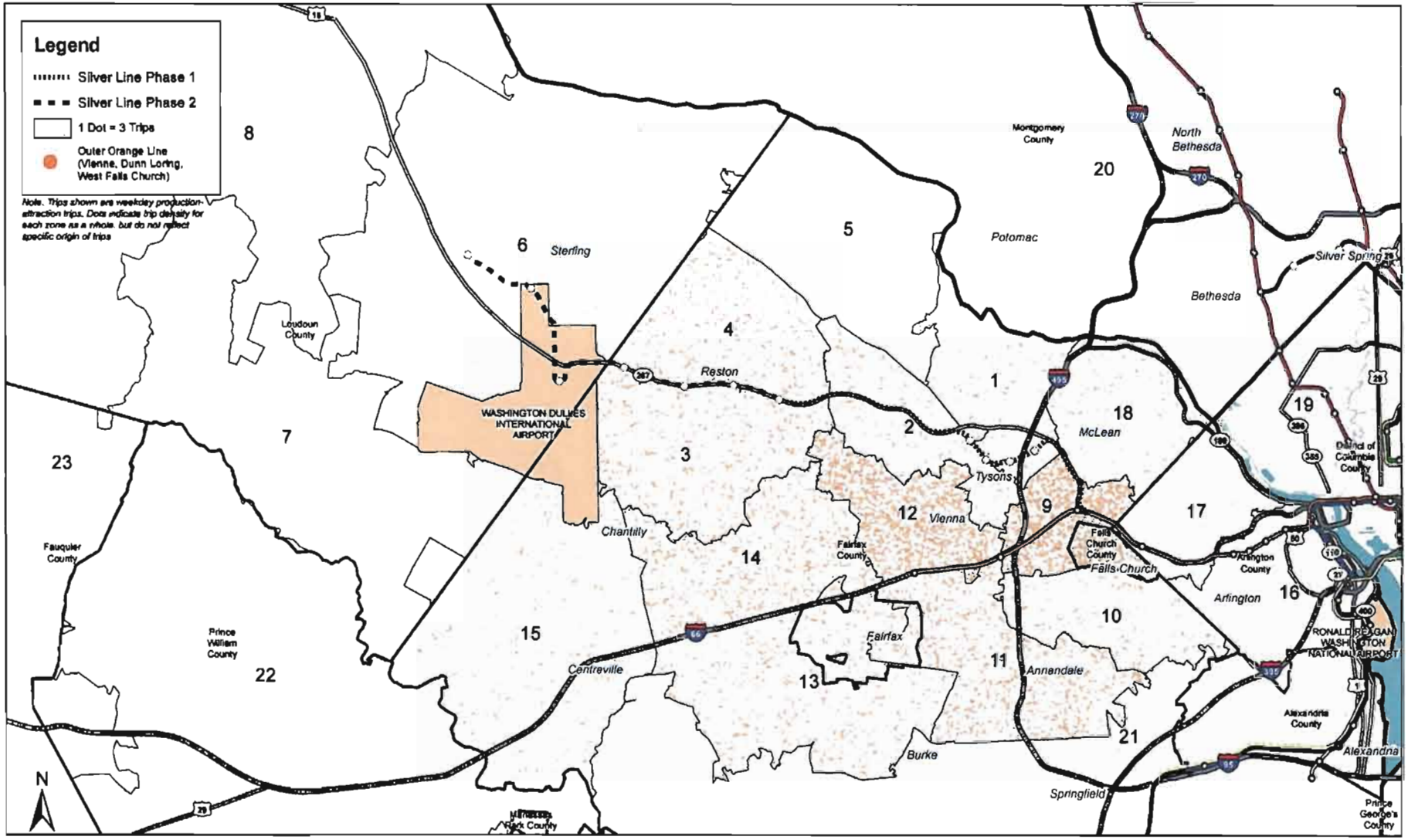


Figure 6-6: Zip Code of Place of Residence to Origin Station - After Conditions

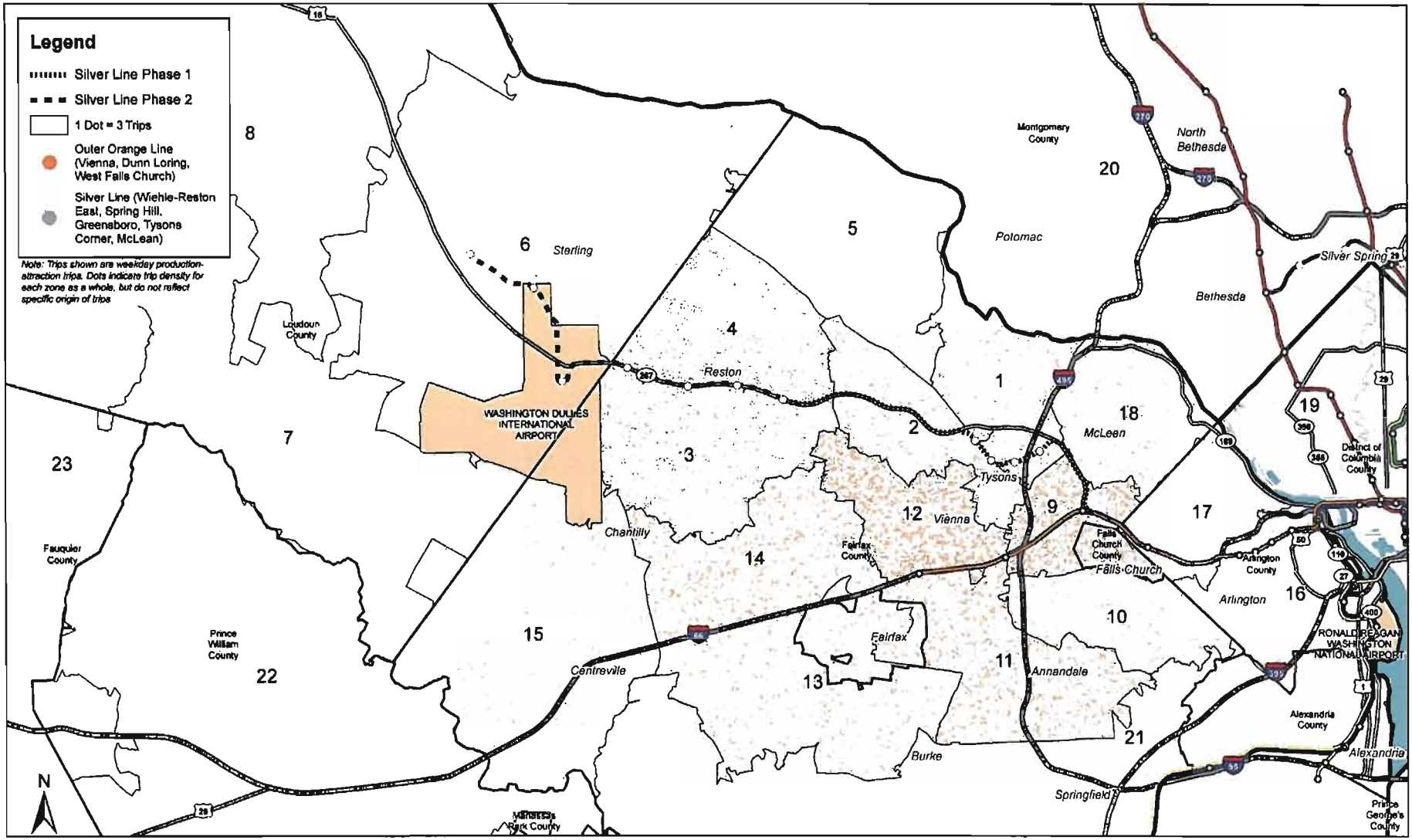


Figure 6-7: Zip Code of Place of Residence to Origin Station – Comparison of Before and After Conditions

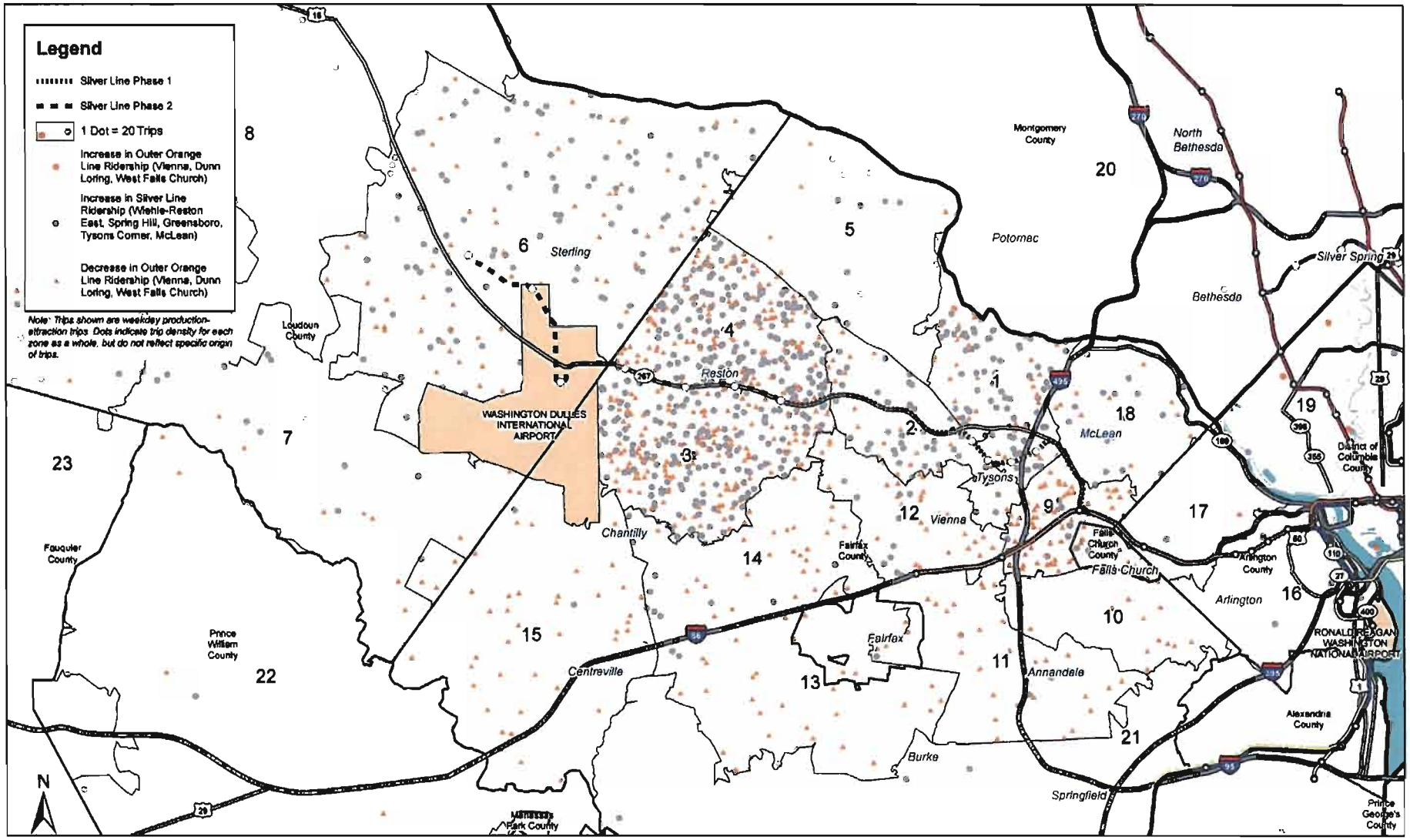


Figure 6-8: Zip Code of Place of Residence to Origin Station – Shift in Ridership from Orange to Silver Line

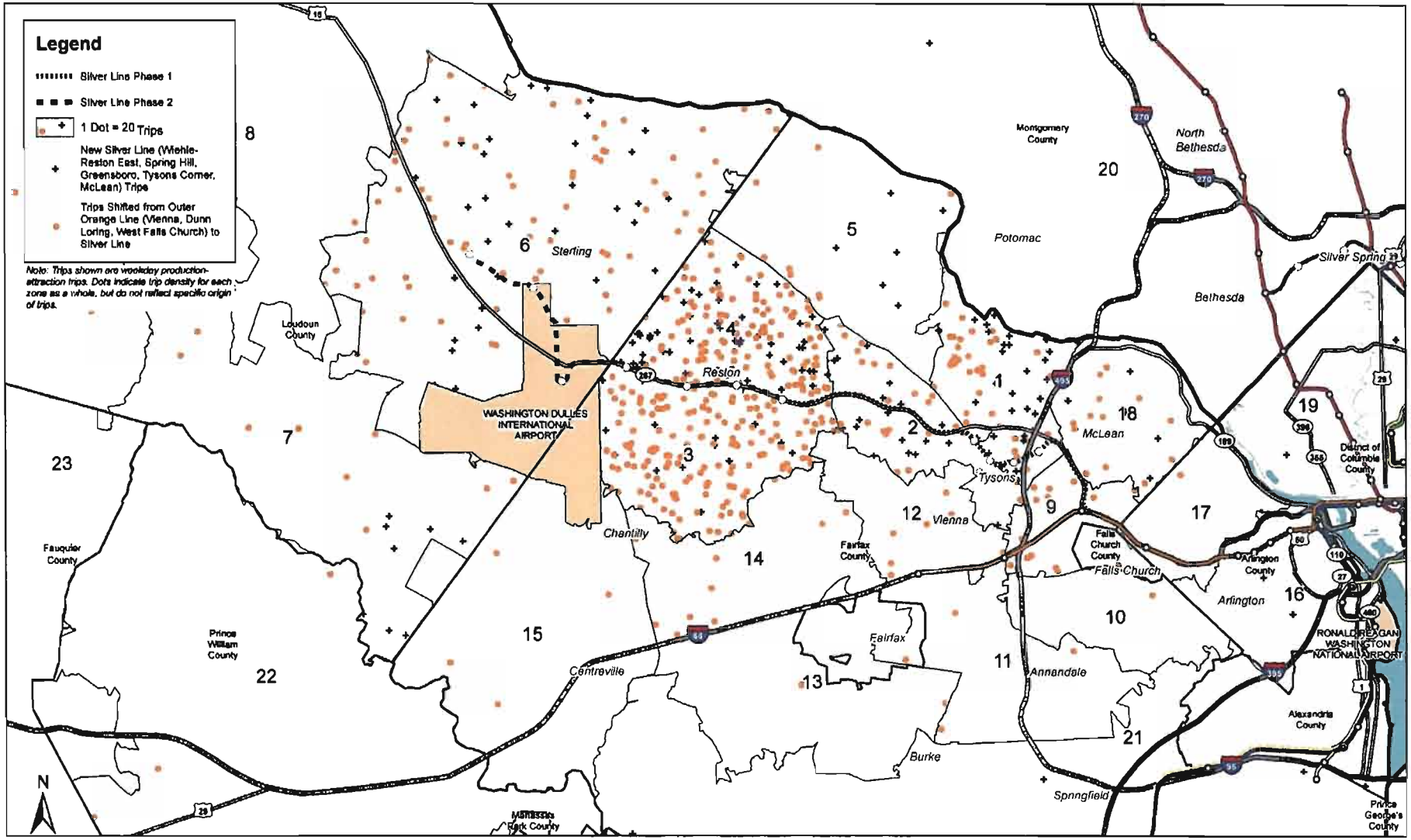


Figure 6-9: Primary Station of Access for Home-Based Trips by TAZ of Residence - Before Study (2012)

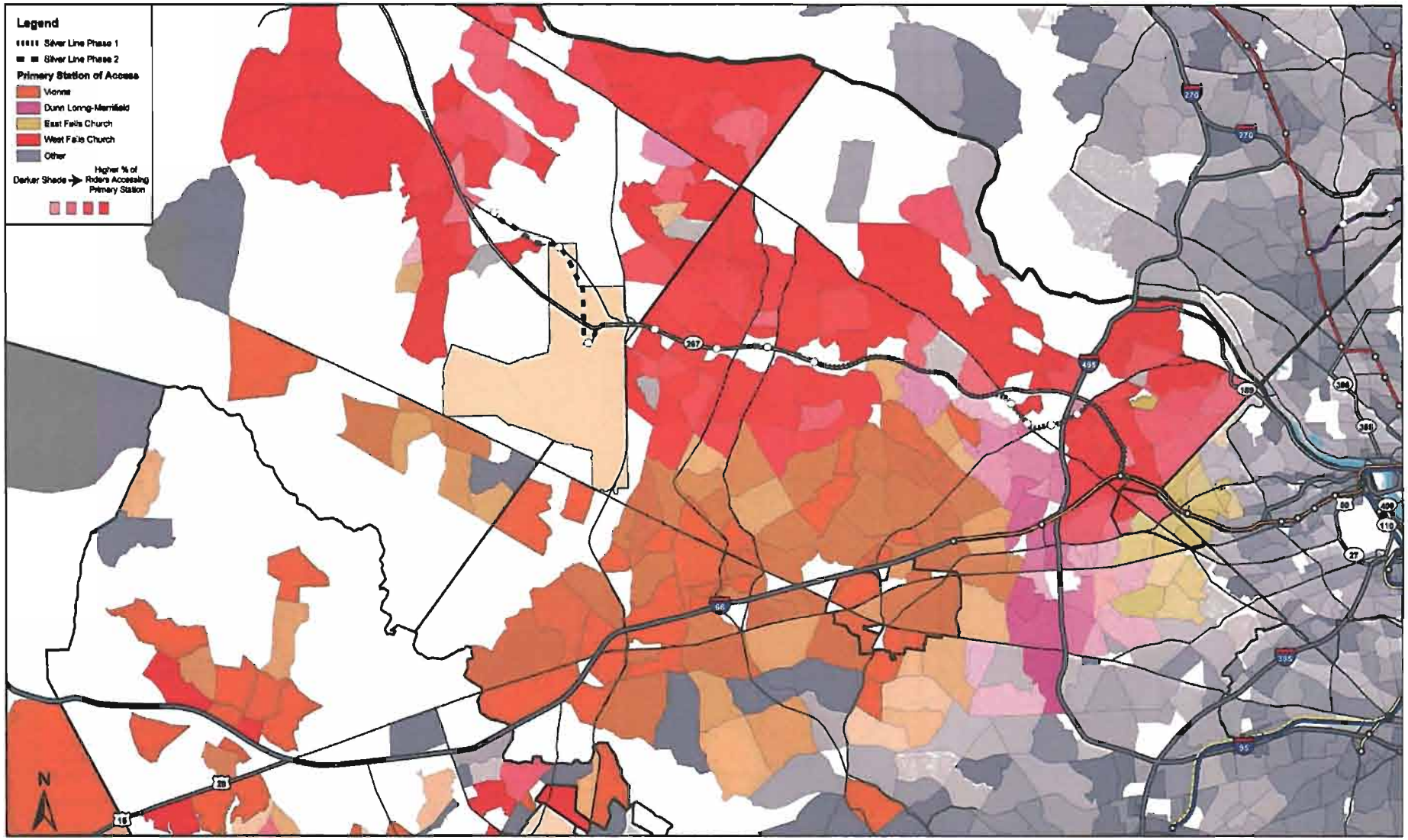
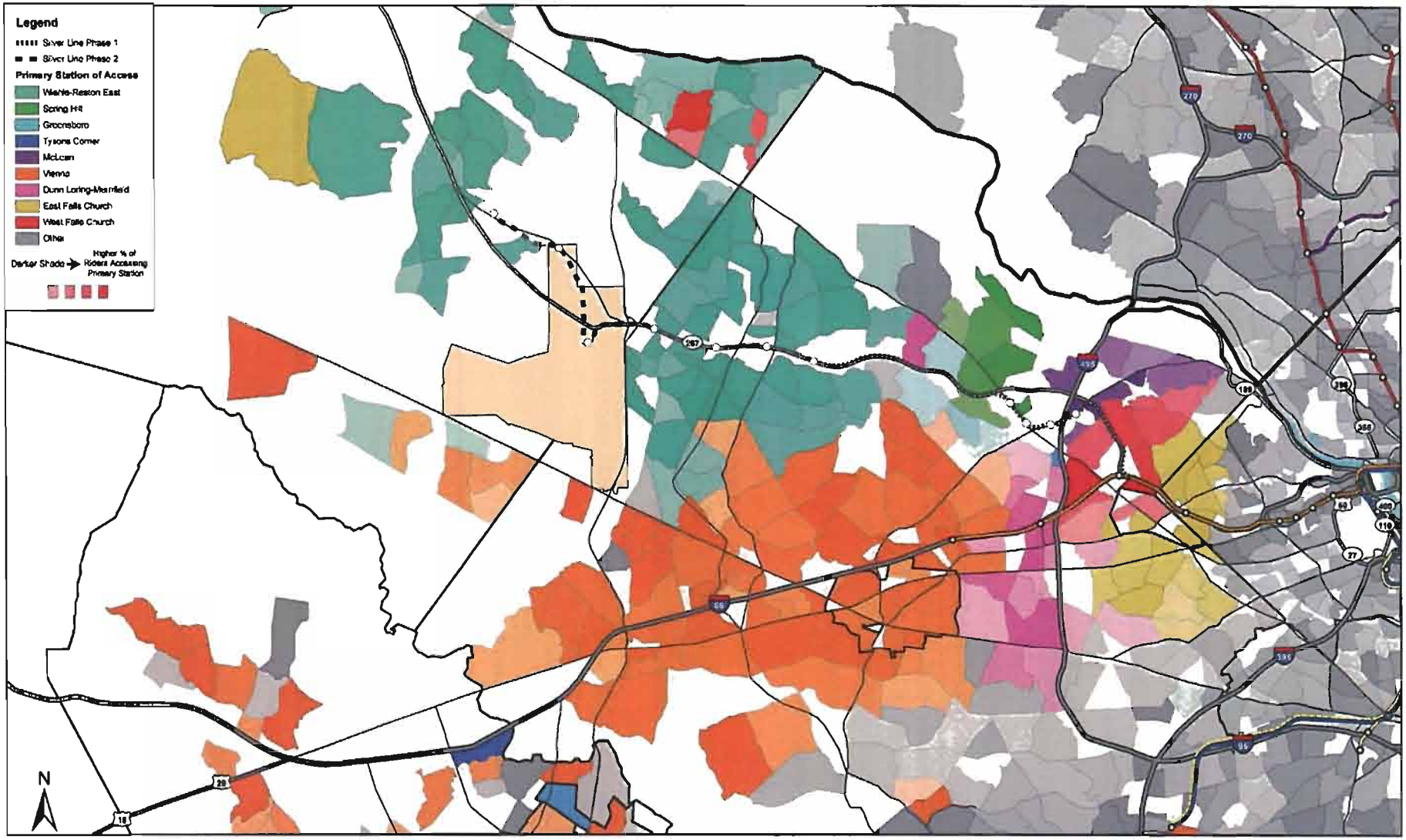


Figure 6-10: Primary Station of Access for Home-Based Trips by TAZ of Residence - After Study (2016)



6.2.3 Accuracy of Predictions and Causes of Differences

Faregate activity data was used to evaluate the revealed accuracy of travel demand model ridership forecasts prepared during the project development phase. Ridership forecasts projected rail production-attraction trips for opening year conditions for "Build" and "Baseline" scenarios to represent the conditions with and without the Project, respectively. Opening year was envisioned during the project development phase as 2011, while the project didn't ultimately open until 2014. Actual faregate data was converted into a station group to station group production-attraction format to allow for a comparison against the Build scenario projections. **Table 32** shows a comparison of ridership forecasts developed during various phases of the project. These phases include Entry to PE (2004) and Entry to FD (2006). No new travel demand modeling was performed prior to project FFGA.

Information was available from the travel demand models used at those project milestones at the station or station group level. To provide a more descriptive comparison of model projections and actual activity, the model created at the Entry to FD milestone was re-run by the FTA in 2017 for the purposes of this report. It should be noted that there were slight differences in ridership volumes between the re-run model and those presented in Entry to FD phase. This 2017 model run is also presented in **Table 32**. Actual ridership numbers from the 2016 faregate data (with and without the headwind adjustment) are also shown for comparison.

Table 32 : Ridership Forecasts

Project Phase	Metrorail System Trips	Silver Line Trips	Outer Orange Line Trips
Entry to PE	826,500	62,800	39,900
Entry to FD	817,700	66,100	42,100
2017 Entry to FD Model Run	812,800	66,000	42,100
Actual Ridership (Based on 2016 Faregate Data)	676,900	27,900	34,600
Headwind-Adjusted Actual Ridership	766,407	32,000	39,100

Notes:

1. *Trips are shown in Production-Attraction format.*
2. *For this comparison, Outer Orange Line trips represent total production and attraction trips at the Vienna, Dunn Loring, and West Falls Church Metrorail Stations.*

As can be noted in the above table, ridership forecasts were higher than actual ridership at the project and systemwide level, without accounting for the headwind.

Further analysis was completed to compare projections with actual ridership at the station level and by trip purpose. **Figure 6-11** and **Figure 6-12** compare projected and actual daily total trips for trips that pass through the Silver Line stations at the production end and attraction end, respectively, of the trip. More detailed comparison tables and charts, including comparison by trip purpose, are shown in

Appendix A5.6. The projected trips in these comparisons are from the 2017 re-run of the Entry to FD phase ridership model.

As shown in the figures, the projected trips were greater than the actual trips, particularly at the Spring Hill Metrorail Station. Overall, the headwind-adjusted actual trips at Silver Line stations were 52 percent lower than projected. However, the actual trips at the Outer Orange Line stations were much closer (18 percent lower) to the projected trips at those stations, even before accounting for the headwind. The headwind-adjusted actual trips at the Outer Orange Line stations were 7 percent lower than projected.

To identify potential sources of error in ridership modeling, the projected population and employment characteristics of the Project corridor were compared to actual population and employment numbers.

At McLean Metrorail Station, actual production trips were 44 percent lower than projected, and attraction trips were 59 percent lower than projected. The ridership model was found to have significantly underestimated population (actual population was 58 percent higher) and significantly overestimated employment (actual employment was 55 percent lower) around the station. The ridership anticipated jobs significantly outnumbering residents, whereas actual conditions shown an even split between residents and jobs.

At Tysons Corner Metrorail Station, actual production trips were 32 percent lower than projected, and attraction trips were 25 percent lower than projected. Of the five Silver Line stations, land use predictions here relatively more accurate; this is consequently reflected in the relatively lower error in ridership projections. The model had minimal error in projecting population and slightly underestimated employment (actual employment was 17 percent higher than projected).

At Greensboro station, actual production trips were 51 percent lower than projected, and attraction trips were 60 percent lower than projected. The discrepancy in ridership is reflected in the discrepancy in the modeled land use. The ridership model was found to have significantly overestimated both population (actual population was 69 percent lower) and employment (actual employment was 47 percent lower) around the station.

At Spring Hill station, the actual production trips were 59 percent lower than projected, and attraction trips were 91 percent lower than projected. This represented the greatest discrepancy between projected and actual trips among the five Project stations. This aligned with the greatest discrepancy in projected employment; actual employment near the Spring Hill Metrorail Station was significantly overestimated – there were 81 percent less jobs than projected. There was minimal error in the model's population projection.

At Wiehle station, the actual production trips were 47 percent lower than projected, and attraction trips were 53 percent lower than projected. In this instance, the ridership model was the most accurate in projecting employment and population. The model's population projection was 14 percent higher than actual and there was minimal error in its employment projections.

Figure 6-11: Projected vs. Actual Daily Total Trips – Production Station

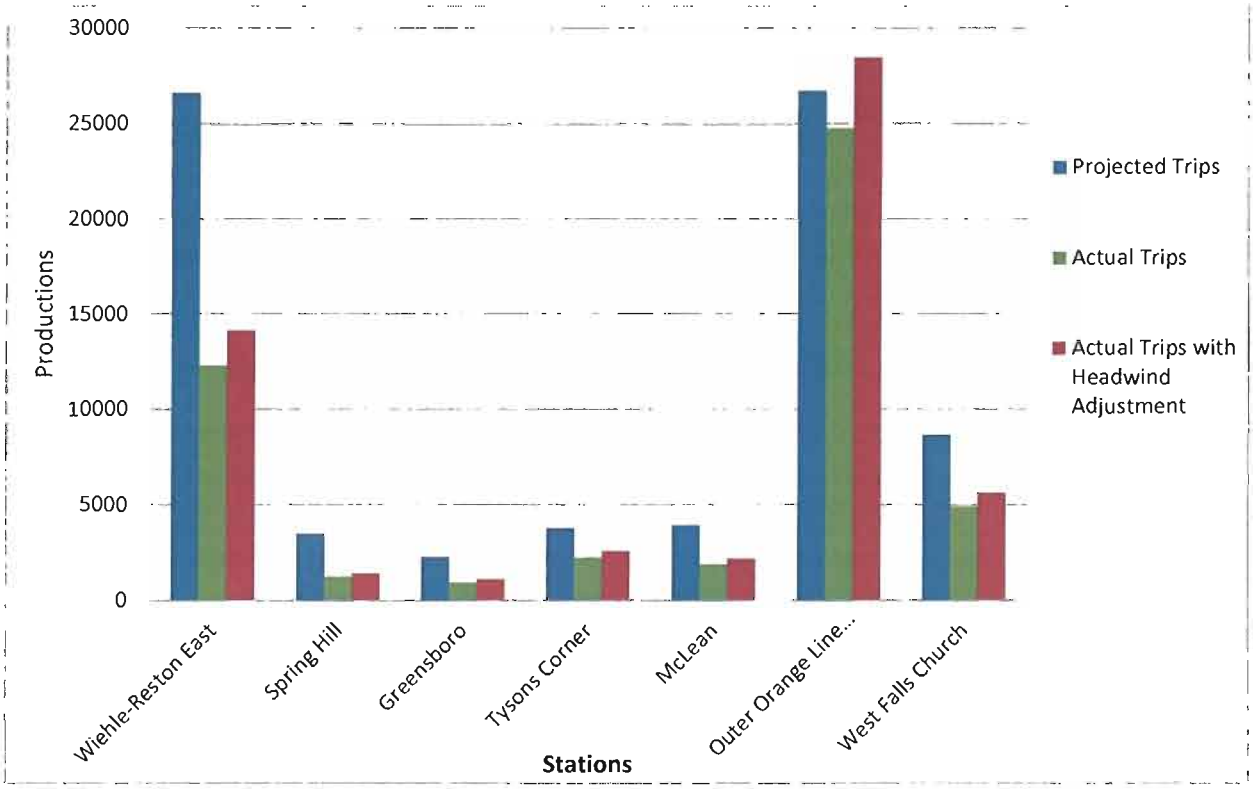
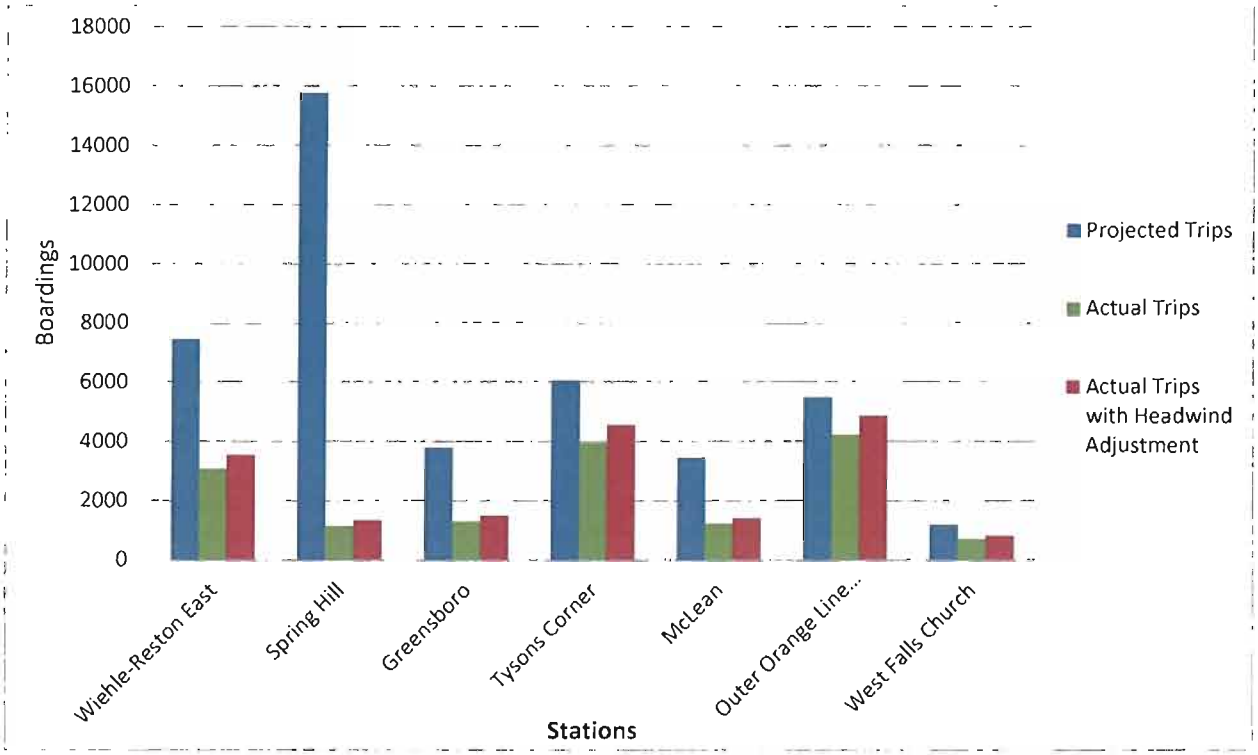


Figure 6-12: Projected vs. Actual Daily Total Trips – Attraction Station



6.3 Lessons Learned

The analysis found a large discrepancy between ridership forecasts and actual ridership experienced within the Metrorail system. Actual ridership was lower than expected due to a number of factors; these included factors contributing to nationwide decreases in transit ridership which could not have been reasonably predicted at the time of ridership modeling, as well as factors specific to the Metrorail system as a result of widely reported incidents and corresponding maintenance work that occurred on the system subsequent to the modeling effort. Additionally, ridership forecasts were higher than actual conditions due to a much higher projected land use intensity near Project stations than what was constructed and occupied at the time of the after analysis. Based on the comparison of modeled and actual land use, it appeared that substantial development activity took longer than originally envisioned in the modeling effort.

These results demonstrate that it is challenging to account for future volatility in transit ridership, particularly related to system-specific factors such as those affecting Metrorail. Additional effort may be needed to properly represent the potential risk from these factors in ridership forecasts, and to properly forecast the rate of land use intensification upon which forecasts are based.

Dulles Corridor Metrorail Project – Extension to Wiehle Avenue (Phase 1) Before and After Study

Task 5 – Comparative Analysis for Before and After Study – Appendices

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

IN COORDINATION WITH

THE WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY AND

THE FEDERAL TRANSIT ADMINISTRATION

DECEMBER 2018

DULLES CORRIDOR METRORAIL PROJECT

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

metro

FTA Federal Transit Administration

PHASE 1: EXTENSION TO WIEHLE AVENUE

APPENDICES CONTENTS

Appendices Contents 1
A1. Physical Scope 2
A1.1 Summary of Station Facilities 2
A2. Capital Cost 5
A2.1 Actual and Predicted Costs for Each Year of the Project Development Schedule 5
A3. Transit Services and Fare Policies 8
A4. Operations And Maintenance (O&M) Cost 11
A5. Ridership 13
A5.1 Transit Ridership 13
A5.2 Derivation of Headwind Adjustment 21
A5.3 Station Group to Station Group Ridership – With Headwind Adjustments 23
A5.3.1 Adjusted Trips on the Project – After Conditions 23
A5.3.2 Change in Adjusted Rail Trips – Station-Group to Station-Group 27
A5.4 Station Group to Station Group Ridership – Without Headwind Adjustments 51
A5.4.1 Change in Unadjusted Rail Trips – Station-Group to Station-Group 55
A5.5 Residence Location to Origin Station Ridership Patterns 79
A5.6 Projected vs Actual Station-Group-to-Station-Group Ridership 97
A5.7 Additional Mode of Access Comparison 125
A5.7.1 Bus-to-Rail Transfers 125
A5.7.2 Parking Access 126
A6. Other Impacts 130

A1. PHYSICAL SCOPE

A1.1 Summary of Station Facilities

Table A1: Summary of Station Facilities at Entry to PE

Station Names	Escala-tors	Eleva-tors	Stairs	Bus Bays			K&R Spaces				P&R Spaces		AFC Equipment						
				Revenue		Layover	Drop-off/Pick-up	Taxi and Curb-side	Motor-cycle	Shuttle	Short-term	Long-term	Faregates		Farecard		Exit Fare	Bus Xfer	Smar-trip[2]
				Std.	S-tooth	Std.							Initial	Future[1]	Initial	Future[1]			
Tysons E.																			
Station	2	2	2										6		3				
North Entrance	2	2	2	2															
South Entrance	2	2	2	2			33	11	7										
Tysons C. 123																			
Station	2	2	2																
North Entrance[4]	4	2	2	3									7	1	6		4		
South Entrance[3]	2	2	1	3															
Tysons C. 7																			
Station	4	4	3										5	1	5		2		
North Entrance	2	2	1																
South Entrance	2	2	1																
Tysons W.																			
Station	2	2	2																
North Entrance	2	2	2		5	3	33						9		5	1	2		
South Entrance		2	1																
Wiehle Avenue																			
Station	2	2	2										6	1	4		2		
North Entrance	3	5	2		12	3	45					2300							
South Entrance	1	2	1		5														

Notes:

1. Faregate and Farecard "future" quantities reflect expansion capacity/accommodation. AFC equipment to be provided by WMATA.

2. SmarTrip equipment and/or ATM equipment provided by WMATA, with conduit provisions by Design/Build Contractor.

3. South Entrance Pavilion and Bus Loading area are provided by others.

4. North Entrance Pavilion consists of (4) escalators providing (2) runs.

Table A2: Summary of Station Facilities at Entry to FD

Station Names	Escala-tors	Eleva-tors	Stairs	Bus Bays			K&R Spaces				P&R Spaces		AFC Equipment						
				Revenue		Layover	Drop-off/Pick-up	Taxi and Curb-side	Motor-cycle	Shuttle	Short-term	Long-term	Faregates		Farecard		Exit Fare	Bus Xfer	Smar-trip[2]
				Std.	S-tooth	Std.							Initial	Future[1]	Initial	Future[1]			
Tysons E.																			
Station	2	2	2										5	1	2	2	2	2	1
North Entrance	2	2	1	2															
South Entrance	2	2	1	3		1	24	6	9	5									
Tysons C. 123																			
Station	2	2	2										6	1	3	1	2	2	1
North Entrance[4]	4	2	1	3															
South Entrance[3]	2	2	1	3															
Tysons C. 7																			
Station	2	2	2										5	2	2	2	2	2	2
North Entrance	1+1 future	2	2																
South Entrance	1+1 future	2	2																
Tysons W.																			
Station	2	2	2										5	2	2	3	2	2	1
North Entrance	2	2	1	5			30	4											
South Entrance	1+1 future	2	2																
Wiehle Avenue																			
Station	2	2	2										7		4		2	2	1
North Entrance	4	3	1		12	3	26	5	8	3	217	2048							
South Entrance	2	2	1	5															

Notes:

1. Faregate and Farecard "future" quantities reflect expansion capacity/accommodation. AFC equipment to be provided by WMATA.

2. SmarTrip equipment and/or ATM equipment provided by WMATA, with conduit provisions by Design/Build Contractor.

3. South Entrance Pavilion and Bus Loading area are provided by others.

4. North Entrance Pavilion consists of (4) escalators providing (2) runs.

Table A3: Summary of Station Facilities at Entry to FD

Station Names	Escala-tors	Eleva-tors	Stairs	Bus Bays			K&R Spaces				P&R Spaces		AFC Equipment						
				Revenue		Layover	Drop-	Taxi and	Motor-		Short-	Long-	Faregates		Farecard		Exit	Bus	Smar-
				Std.	S-tooth	Std.	off/Pick-up	Curb-side	cycle	Shuttle	term	term	Initial	Future[1]	Initial	Future[1]	Fare	Xfer[5]	trip[2,5]
Tysons E.																			
Station	2	2	2										6	2	3	1	2	-	-
North Entrance	2	2	1	2															
South Entrance	2	2	1	3		1	24	6	9	5									
Tysons C. 123																			
Station	2	2	2										6	1	3	1	2	-	-
North Entrance[4]	6	4	1	3															
South Entrance[3]	2	2	1	3															
Tysons C. 7																			
Station	2	2	2										5	2	2	2	2	-	-
North Entrance	1+1 future	2	2																
South Entrance	1+1 future	2	2																
Tysons W.																			
Station	2	2	2										5	2	2	3	2	-	-
North Entrance	2	2	1	5			30	4											
South Entrance	1+1 future	2	2																
Wiehle Avenue																			
Station	2	2	2										7		4		2	-	-
North Entrance	4	3	1		12	3	26	5	8	3	217	2048							
South Entrance	2	2	1	5															

Notes:

1. Faregate and Farecard "future" quantities reflect expansion capacity/accommodation. AFC equipment to be provided by WMATA.

2. SmarTrip equipment and/or ATM equipment provided by WMATA, with conduit provisions by Design/Build Contractor.

3. South Entrance Pavilion and Bus Loading area are provided by others.

4. North Entrance Pavilion consists of (4) escalators providing (2) runs.

5. Bus TR

A2. CAPITAL COST

A2.1 Actual and Predicted Costs for Each Year of the Project Development Schedule

Table A4: Actual and Predicted Costs for Each Year of the Project Development Schedule

SCC Code	Milestone of Project Development Schedule Original dollar year of the actual or predicted costs SCC Code Description	Actual Cost 2009 - 2014 (millions of YOE Dollars)	Actual Cost 2009 - 2014 (millions of 2008 Dollars)	Predicted Cost - Entry to PE 2004 (millions of 2008 Dollars)	Predicted Cost - Entry to FD 2007 (millions of 2008 Dollars)	Predicted Cost - FFGA 2008 (millions of 2008 Dollars)	Difference Between Predicted and Actual - FFGA (millions of YOE Dollars)	Difference Between Predicted and Actual - FFGA (millions of 2008 Dollars)	Scope changes from FFGA to As-Built - in YOE (2008) Dollars
10.0	**GUIDEWAY & TRACK ELEMENTS**	**$574.10**	**$512.67**	**$367.52**	**$616.52**	**$600.52**	**($26.42)**	**($87.85)**	
10.01	Guideway: At-Grade Exclusive Right-of-Way			$49,624					
10.02	Guideway: At-Grade Mixed and/or Cross Traffic								
10.03	Guideway: Aerial Structure			$106,105		$262,339			
10.04	Guideway: Built-up Fill			$23,536	$291,156	$0			
10.05	Guideway: Underground Cut & Cover			$35,590	$0	$23,586			
10.06	Guideway: Underground Tunnel			$101,517	$19,422	$114,041			
10.07	Guideway: Retained Cut			$8,052	$109,853	$124,666			
10.08	Track: Direct Fixation			$13,969	$120,967	$26,435			
10.09	Track: Embedded				$26,167	$0			
10.10	Track: Ballasted			$21,489	$0	$40,135			
10.11	Track: Special (switches, turnouts)			$7,635	$39,696	$9,315			
10.12	Track: Vibration and noise dampening				$9,258	$0			
10.13	Track: Vibration and noise dampening				$0				
20.0	**STATIONS, STOPS, TERMINALS, INTERMODAL**	**$316.19**	**$282.36**	**$298.50**	**$288.68**	**$286.89**	**$29.30**	**($4.53)**	- Tysons Central 123 - South Pavilion Construction = $17M ($15M) - Escalation of prices of certain materials and equipment = $17.5M ($15.6M) - Mechanical, Electrical, Plumbing, Elevator/Escalator - Finishes Changes = $7.5M ($6.7M) - Pedestrian Bridge/Pavilion Changes = $400,000 ($357,000)
20.01	At-grade station, stop, shelter, mall, terminal, platform (Entry to PE No. 2.03)				$96,999	$96,213			
20.02	Aerial station, stop, shelter, mall, terminal, platform (Entry to PE No. 2.04)				$115,808	$115,517			
20.03	Underground station, stop, shelter, mall, terminal, platform (Entry to PE No. 20.5, combines into 20.01)			$25,347	$0				
20.04	Other stations, landings, terminals: Intermodal, ferry, trolley, etc. (Entry to PE No. 2.06)			$108,924	$0				
20.05	Joint development (Entry to PE No. 2.07)			$97,160	$0				
20.06	Automobile parking multi-story structure (Entry to PE No. 2.08)			$39,579	$34,635	$34,131			
20.07	Elevators, escalators (Elevators for Entry to PE No. 6.08)			$27,486	$41,240	$41,029			
20.08	Escalators (Escalators for Entry to PE No. 6.09, combines into 20.07)								
30.0	**SUPPORT FACILITIES: YARDS, SHOPS, ADMIN.**	**$64.01**	**$57.16**	**$57.58**	**$46.71**	**$47.52**	**$16.49**	**$9.64**	- West Falls Church Yard (WFCY) Scope Increase = $18.6M ($16.6M)

30.01	Administration Building: Office, sales, storage, revenue counting				$1,712	$1,654			- WFCY systems-related scope changes = $4.6M ($4.1M) - WFCY sitework and utilities scope changes = $2.4M ($2.1M)
30.02	Light Maintenance Facility				$0	$0			
30.03	Heavy Maintenance Facility			$57,582	$24,050	$24,961			
30.04	Storage Building & Yard				$0	$0			
30.05	Maintenance of Way Building & Yard				$20,943	$20,901			
40.0	**SITEWORK & SPECIAL CONDITIONS**	**$227.69**	**$203.33**	**$53.94**	**$239.60**	**$221.04**	**$6.65**	**($17.71)**	- Misc. sitework, site utilities, site features, retaining walls = $-783,000 ($-699,000) - Sales Tax = $10.2M ($9.1M) (SCC 40.08); - Builder's Risk, acceleration, Snow removal, temp. power = $5.2M ($4.6M) (SCC 40.08)
40.01	Demolition, Clearing, Earthwork			$765	$21,317	$14,851			
40.02	Site Utilities, Utility Relocation			$30,196	$125,874	$110,846			
40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments				$9,426	$9,518			
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks			$4,037	$0	$0			
40.05	Site structures including retaining walls, sound walls				$10,726	$10,656			
40.06	Pedestrian / bike access and accommodation, landscaping (Entry to PE included roads, parking lots)			$14,699	$10,465	$11,402			
40.07	Automobile, bus, van accessways including roads, parking lots (Entry to PE included site furniture, lighting, shelters, bike facilities, signage, fencing)			$2,633	$11,131	$13,337			
40.08	Temporary Facilities and other indirect costs during construction				$50,656	$50,432			
40.09	Public Art			$1,610	$0				
50.0	**SYSTEMS**	**$278.03**	**$248.28**	**$146.09**	**$251.73**	**$244.74**	**$33.29**	**$3.54**	- Remote Monitoring & Communications = $10.2M ($9.1M) - Security Access and Miscellaneous = $1.4M ($1,3M)
50.01	Train control and signals			$56,538	$61,740	$62,244			
50.02	Traffic signals and crossing protection				$0	$0			
50.03	Traction power supply: substations			$37,552	$62,051	$56,870			
50.04	Traction power distribution: catenary and third rail			$21,358	$77,085	$74,954			
50.05	Communications			$21,017	$38,436	$38,620			
50.06	Fare collection system and equipment			$9,621	$7,421	$7,206			
50.07	Central Control				$4,994	$4,849			
60.0	**ROW, LAND, EXISTING IMPROVEMENTS**	**$53.33**	**$47.62**	**$96.49**	**$53.68**	**$44.41**	**$8.92**	**$3.21**	
60.01	Purchase or lease of real property			$96,492	$51,912	$42,250			
60.02	Relocation of existing households and businesses				$1,768	$2,156			
70.0	**VEHICLES**	**$130.38**	**$116.43**	**$195.37**	**$172.39**	**$185.47**	**($55.09)**	**($69.04)**	Reduction due to additional funding from WMATA due to MWAA/WMATA agreement
70.01	Light Rail								
70.02	Heavy Rail			$195,367	$167,703	$180,379			
70.03	Commuter Rail								
70.04	Bus								
70.05	Other				$678	$730			
70.06	Non-revenue vehicles				$4,009	$4,360			
70.07	Spare parts (Entry to PE No. 70.08)								
80.0	**PROFESSIONAL SERVICES**	**$854.86**	**$763.39**	**$273.78**	**$653.06**	**$678.46**	**$176.40**	**$84.93**	Additional Professional Services

80.01	Preliminary Engineering			$34,359	$101,832	$108,256			
80.02	Final Design			$51,538	$151,275	$150,370			
80.03	Project Management for Design and Construction				$133,731	$145,803			
80.04	Construction Administration & Management			$75,153	$227,809	$229,558			
80.05	Professional Liability and other Non-Construction Insurance (Entry to PE includes 80.06 costs)			$46,970	$24,709	$31,162			
80.06	Legal; Permits; Review Fees by other agencies, cities, etc.				$125	$120			
80.07	Surveys, Testing, Investigation, Inspection (Entry to PE includes Agency PA/PM)			$37,576	$0	$0			
80.08	Start up			$28,182	$13,578	$13,189			
90.0	**UNALLOCATED CONTINGENCY**	**$0.00**	**$0.00**	**$65.79**	**$127.50**	**$115.96**	**($115.96)**	**($115.96)**	Distributed to other SCC categories
100.0	**FINANCE CHARGES**	**$284.28**	**$253.86**	**$0.00**	**$366.74**	**$418.98**	**($134.70)**	**($165.12)**	
TOTAL		**$2,782.86**	**$2,485.10**	**$1,555.05**	**$2,816.60**	**$2,843.98**	**($61.12)**	**($358.89)**	

A3. TRANSIT SERVICES AND FARE POLICIES

Table A5: WMATA Metrobus Level of Service Changes from Entry to PE to As-Built

Service at Entry to PE			Service at As-Built		
Route	Route Name	Weekday Revenue Hours	Route	Route Name	Weekday Revenue Hours
2A	Washington Boulevard Line	5.7	2A	Washington Blvd.-Dunn Loring Line	60.5
2B/C/G	Washington Boulevard Line	65.4	2B	Fair Oaks-Jermantown Road Line	42.9
2T	Tysons Corner-Dun Loring Line	52.2	2T	Tysons Corner-Dun Loring Line	28.8
--	--	--	3A	Annandale Road Line	23.1
3T	Pimmit Hills Line	29.0	3T	Pimmit Hills Line	49.4
5A	DC - Dulles Line	20.8	5A	DC - Dulles Line	58.6
14A/B	Montgomery-Tysons Beltway Express	17.7	--	--	--
14C/D	--	21.8	--	--	--
15N/S	Tysons Corner-George Mason University	28.5	15M	Tysons Corner Line-George Mason University	23.8
23A/C	McLean-Crystal City Line	118.3	23A	McLean-Crystal City Line	53.8
24T	Westpark Transit Center-East Falls Church	12.2	23T	McLean-Tysons Corner Center	32.6
28A/B	Leesburg Pike Line	93.2	28A	Leesburg Pike Line	151.5
28T	Tysons Corner-West Falls Church	13.4	28X	Leesburg Pike Limited Line	40.5

Table A6: Fairfax County Connector Level of Service Changes from Entry to PE to As-Built

Service at Entry to PE			Service at As-Built		
Route	Route Name	Weekday Revenue Hours	Route	Route Name	Weekday Revenue Hours
RIBS 1	Lake Anne / Hunter Woods Line	34.0	RIBS 1	Lake Anne / Hunter Woods Line	39.9
RIBS 2	South Lakes / Herndon-Monroe Line	34.0	RIBS 2	South Lakes / Wiehle-Reston East	13.3
RIBS 3	Lake Anne / Hunter Woods Line	34.0	RIBS 3	Lake Anne / Hunter Woods Line	39.9
RIBS 4a	North Point-Reston Town Center	17.0	--	--	--
RIBS 4b	Bennington Woods-Reston Town Center	17.0	--	--	--
401/402	Backlick-Gallows	67.5	401/402	Backlick-Gallows	180.2
--	--	--	422	Tysons Circ / Boone-Howard	15.7
--	--	--	423	Tysons Circ / Park Run-Westpark	26.1

--	--	--	424	Tysons Clrc / Jones Branch Drive	34.4
--	--	--	463	Maple Avenue-Vienna	36.3
504	Reston Town Center-Tysons Corner	28.5	--	--	--
505	Sunset Hills-Reston Town Center Line	37.5	505	Reston Town Center	18.4
--	--	--	507	Sunset Hills-Sunrise Valley	12.6
551	South Reston Line	24.0	551	South Lakes Drive	40.4
552	North Reston Line	8.0	552	Reston North	7.3
553	South Reston Line	16.0	553	Reston South	16.7
554	North Reston Line	24.0	554	Reston North	7.2
574a	Tysons Corner-Reston Town Center Line	38.0	574	Reston - Tysons	36.8
574b	Reston - Tysons	34.0	--	--	--
585	Reston South-West Falls Church	15.5	585	Reston South-Franklin Farm	13.2
605	Fair Oaks - Reston Line	50.0	--	--	--
--	--	--	721	(New) Chain Bridge Road-McLean	26.5
922	Herndon Circulator	36.0		--	--
924	Herndon Line	12.0	924	Herndon-Dranesville Road	11.3
925	Reston South / Herndon-Monroe	16.0		--	--
926	Herndon Line	12.0	926	Herndon-Dranesville Road	11.3
927	South Herndon Line	22.5	--	--	--
929	Centreville Road Line	24.0	929	Centreville Road	18.3
950	Herndon/Reston Town Center Line	69.0	950	Herndon - Reston	74.1
959	Herndon-Monroe/Wiehle-Reston East	96.7	--	--	--
980	Herndon/Reston Town Center Line	24.0	980	Herndon - Reston	7.7
981	Tysons West*Park-Dulles Airport	38.0	981/983	Dulles Airport-Wiehle-Reston East	59.0
984	Herndon-Monroe/Wiehle-Reston East	8.0	--	--	--
989	Dulles Corner-Crystal City	16.0	--	--	--
	Tysons Circulator 1	56.7		422 - Implemented as a Tysons Circulator	
	Tysons Circulator 2	48.3		423 - Implemented as a Tysons Circulator	
	Tysons Circulator 3	56.7		424 - Implemented as a Tysons Circulator	
	Tysons Circulator 4	48.3		--	
	Tysons Circulator 5	48.3		--	

Table A7: Loudoun County Transit Level of Service Changes from Entry to PE to As-Built

Service at Entry to PE		Service at As-Built	
Route Name	Weekday Revenue Hours	Route Name	Weekday Revenue Hours
Purcellville/Leesburg - DC	54.0	Loudoun to DC, Rosslyn, Pentagon (DC)	154.1
Purcellville/Leesburg - Dulles North	13.3	--	--
Purcellville/Leesburg/Dulles North- Pentagon	9.5	--	--
Cascades – Wiehle-Reston East	4.2	Potomac Falls-SV Metro Connection (WFC)	14.7
Loudoun 101	67.2	SV Metro Connection Services	27.1
Loudoun 102	38.0	--	--
Loudoun 103*	16.0	--	--
MCI/AOL	25.5	Wiehle-Reston East Reverse Commute & Route 72	34.4
7 to 7 on 7	34.0	--	--
Sterling Connector	15.0	--	--
Dulles North - Town Center	27.0		
Dulles North/Old Ox/Town Center	25.0	Routes 83, 84 & 87X	43.2
Dulles North/Arcola/Stone Ridge	8.0		
Leesburg-Ashburn/772	28.5	--	--
Brambleton/772/Broadlands	16.0	--	--
--	--	Route 88X	8.9
--	--	Route 89X	16.7

A4. OPERATIONS AND MAINTENANCE (O&M) COST

Table A8: Entry to PE Metrorail Service

Route	Run Time (min.)	Dist. (mi.)	Day	Headway (min.)				Number of Train Cars		Heavy Rail Vehicles		Annual Revenue (Dollars)			Trains			
				Early	Peak	Base	Late	Peak	Off-Peak	Peak	Fleet	Car-Miles	Car-Hours	Train-Hours	Early	Peak	Base	Late
Orange A	57	26.15	M-Th	12	7	12	20	Mix 6's/8's	All 6's in Summer	110	132	7,694,000	281,210	49,130	10	17	10	6
			F	12	7	12	20	Mix 6's/8's	All 4's in Winter			2,089,000	76,510	13,460				
Orange C	57	26.33	M-Th	NA	14	NA	NA	All 6's	NA	54	65	2,056,500	70,650	11,790	NA	9	NA	NA
			F	NA	14	NA	NA	All 6's	NA			534,700	18,370	3,070				
Silver	53.9	23.72	M-Th	12	7	12	20	Mix 6's/8's	All 4's	126	151	6,661,300	283,590	51,940	11	18	11	7
			F	12	7	12	20	Mix 6's/8's	All 4's			1,794,800	76,820	14,280				
Blue A	64	29.6	M-Th	14	14	12	20	Mix 6's/8's	All 4's	76	91	5,619,600	223,890	42,970	10	10	12	7
			F	14	14	12	20	Mix 6's/8's	All 4's			1,538,500	61,270	11,940				
Blue B	60	28.72	M-Th	14	14	NA	NA	All 6's	NA	54	65	2,158,100	78,950	13,210	9	9	NA	NA
			F	14	14	NA	NA	All 6's	NA			561,100	20,540	3,440				
Red A	62	31.58	M-Th	8	5	12	15	All 8's	Mix 4's/6's	208	250	13,075,500	452,800	67,710	17	26	11	9
			F	8	5	12	15	All 8's	Mix 4's/6's			3,545,400	122,910	18,640				
Red B	42	19.33	M-Th	NA	5	12	NA	All 6's	Mix 4's/6's	108	130	5,740,000	228,010	40,910	NA	18	8	NA
			F	NA	5	12	NA	All 6's	Mix 4's/6's			1,492,400	59,280	10,640				

Yellow	27	10.63	M-Th	12	7	12	20	Mix 6's/8's	All 4's	58	70	2,565,900	124,210	23,720	5	9	5	3
			F	12	7	12	20	Mix 6's/8's	All 4's			694,300	33,570	6,490				
Green	47	22.75	M-Th	12	7	12	20	Mix 6's/8's	All 4's	108	130	5,402,700	211,360	38,070	9	15	9	6
			F	12	7	12	20	Mix 6's/8's	All 4's			1,458,100	57,300	10,480				
Green*	47	22.75	M-Th	NA	NA	NA	NA	All 6's	NA	24	29	205,100	27,010	4,510	NA	4	NA	NA
			F	NA	NA	NA	NA	All 6's	NA			53,300	7,030	1,170				
Annualized Weekday Totals										**926**	**1,113**	**64,940,300**	**2,515,280**	**437,570**	**71**	**135**	**66**	**38**

Table A9: As-Built Rail Peak Period Service Levels in 2016 Along with Non-Rush Headways

Total Service FY2015	Total Rush Hour Trains	Round Trip Time (mins.)	Rush Hour Headways (mins.)	Non-Rush Headways (mins.)	Rush Scheduled Cars	Cars per Rush Train	Railcar Mileage
Red Line	41	246	6	12/12/15/15	288	20-6's/21-8's	28,011,000
Blue Line	12	72	6	12/12/15/20	84	6-6's/6-8's	13,858,400
Orange Line	22	132	12	12/12/15/20	154	11-6's/11-8's	14,368,900
Yellow Line	21	126	6	12/12/15/20	126	21-6's	10,390,300
Green Line	18	108	6	12/12/15/20	128	8-6's/10-8's	12,132,400
Silver Line	26	156	6	12/12/15/20	156	26-6's	16,447,300
Gap	3	NA	NA	NA	NA	3's-6's	NA
TOTAL	**143**	**NA**	**NA**	**NA**	**936**	**NA**	**95,208,300**

A5. RIDERSHIP

A5.1 Transit Ridership

A number of data sources were relied upon to develop an understanding of transit ridership characteristics in the study area before and after the opening of Silver Line Phase 1. These data sources provide a snapshot of rider demographics, trip patterns, mode of access, and transit network connectivity prior to any effects associated with the project.

Data used in this section was obtained from Metrorail faregate activity reports from May 2012 and May 2016, on-board surveys of Metrorail users conducted in April/June 2012 and Summer 2016, bus intercept surveys conducted in November 2013 and May 2016, and SmarTrip transactions logs from April 2012 and May 2016. The surveys included a wide variety of questions to obtain information about trip and rider characteristics, including place of residence, mode of access, trip purpose, and demographics.

Figure A1 through **Figure A3** show a comparison of before and after conditions boardings by station group (as recorded through faregate data). As noted in the main body of the report, these demonstrate a systemwide decrease in ridership. Further discussion of this decrease, as well as the derivation of the headwind adjustment factor discussed in the main body of the report, is included in **A5.2 Derivation of Headwind Adjustment**.

On-board rail survey responses were weighted against actual faregate data to assess larger trends related to trip types and demographics.

Figure A4 and **Figure A5** show the change in home-based work trips for the Orange and Silver Lines, respectively. **Figure A6** shows the change in Metrorail trips for trips which access the system by parking at a station. **Figure A7** shows in the change in Metrorail trips for trips which access the system by bus.

Figure A1: Before/After Boardings by Station Group - AM Peak

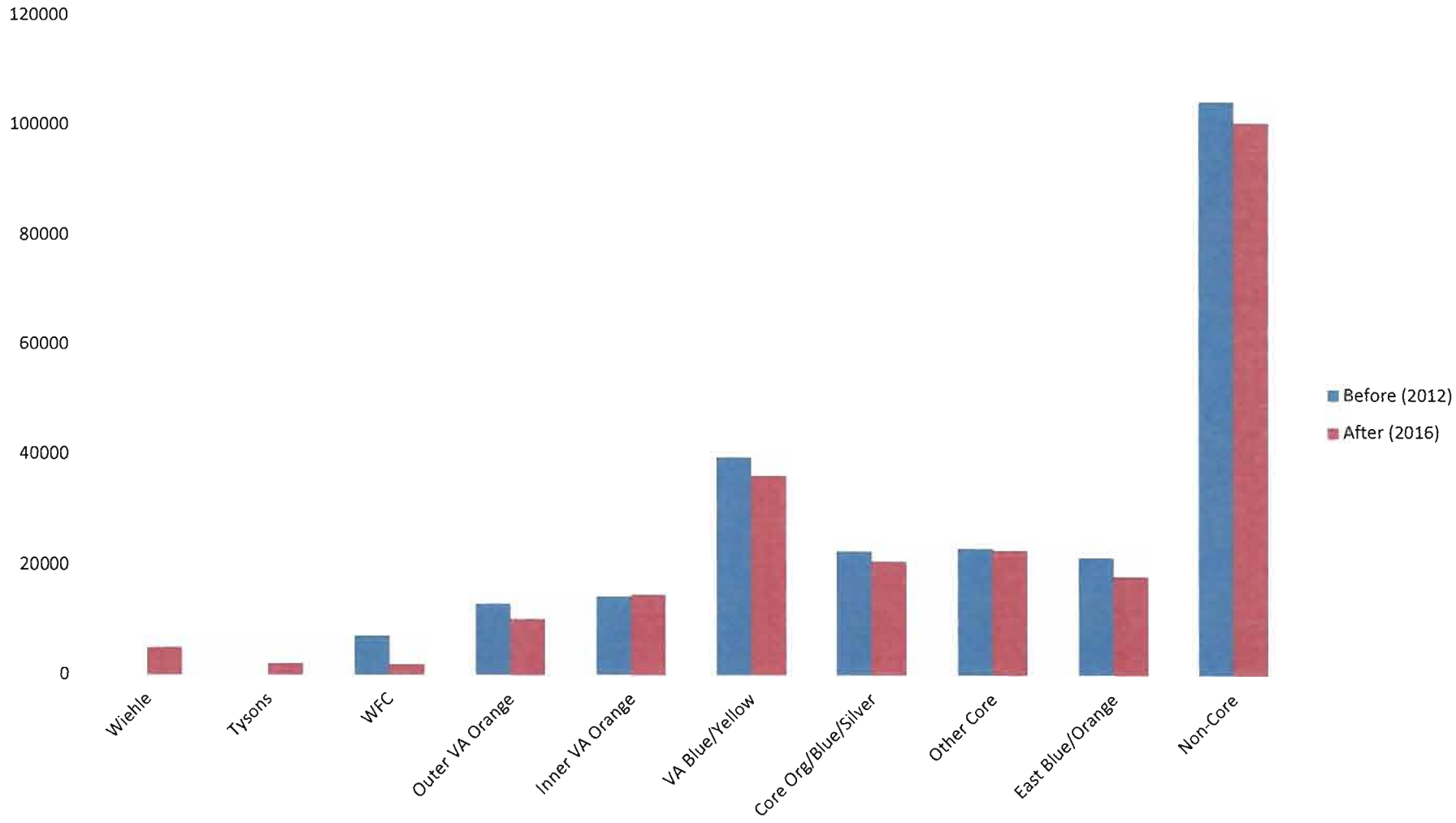


Figure A2: Before/After Boardings by Station Group - PM Peak

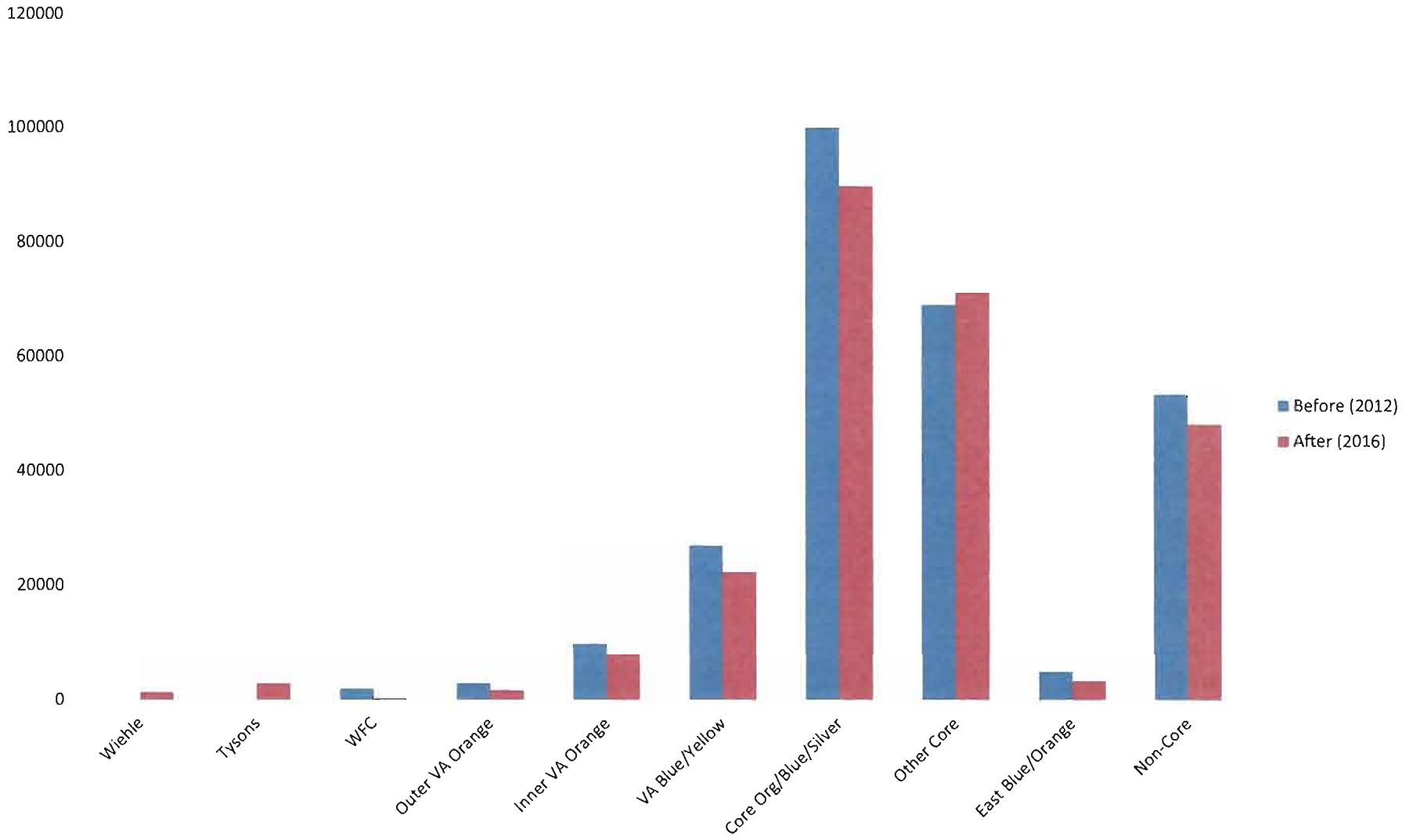


Figure A3: Before/After Boardings by Station Group - Daily

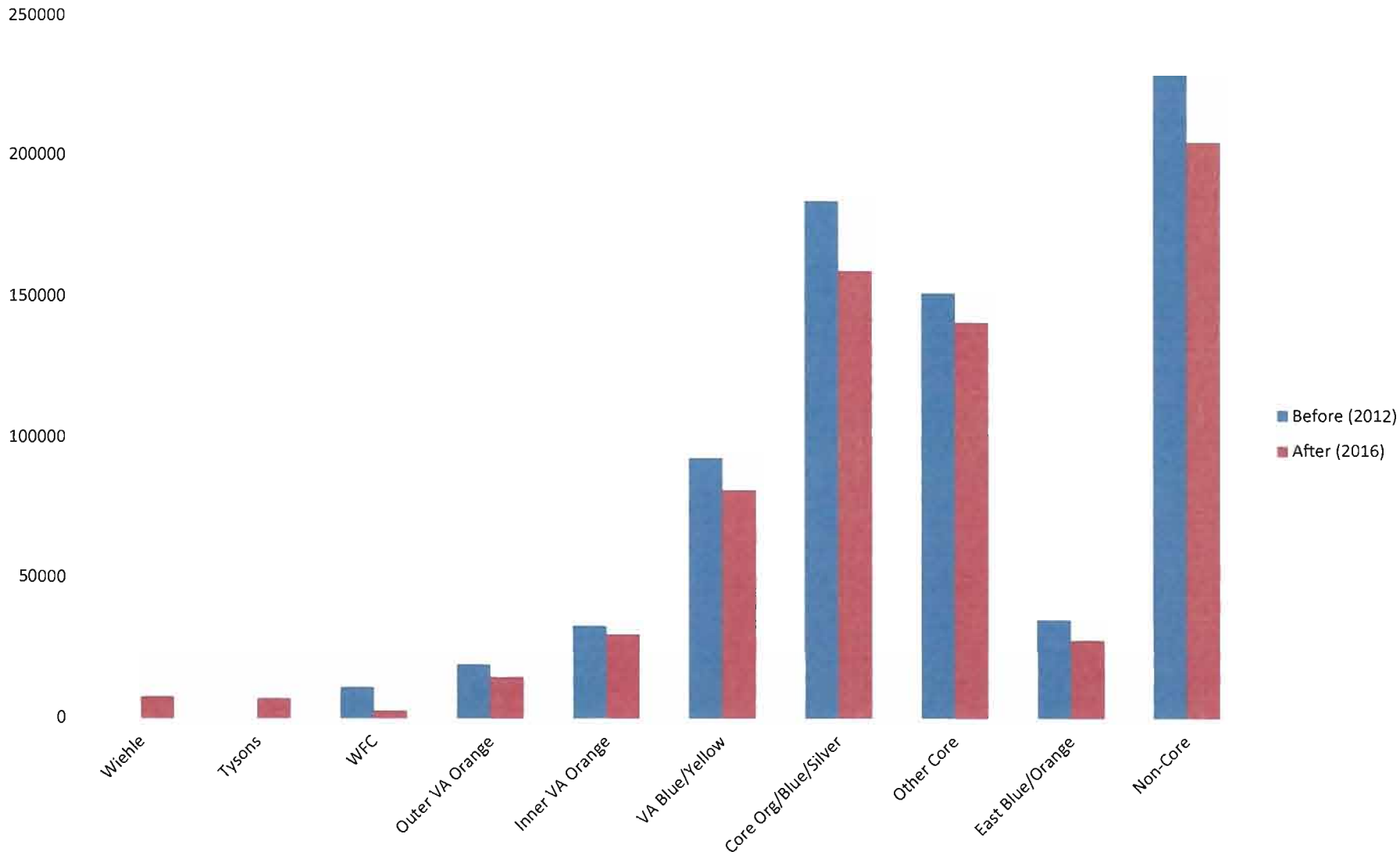


Figure A4: Change in Daily Metrorail Orange Line Trips by Zip Zone of Residence, Home-Based Work Only

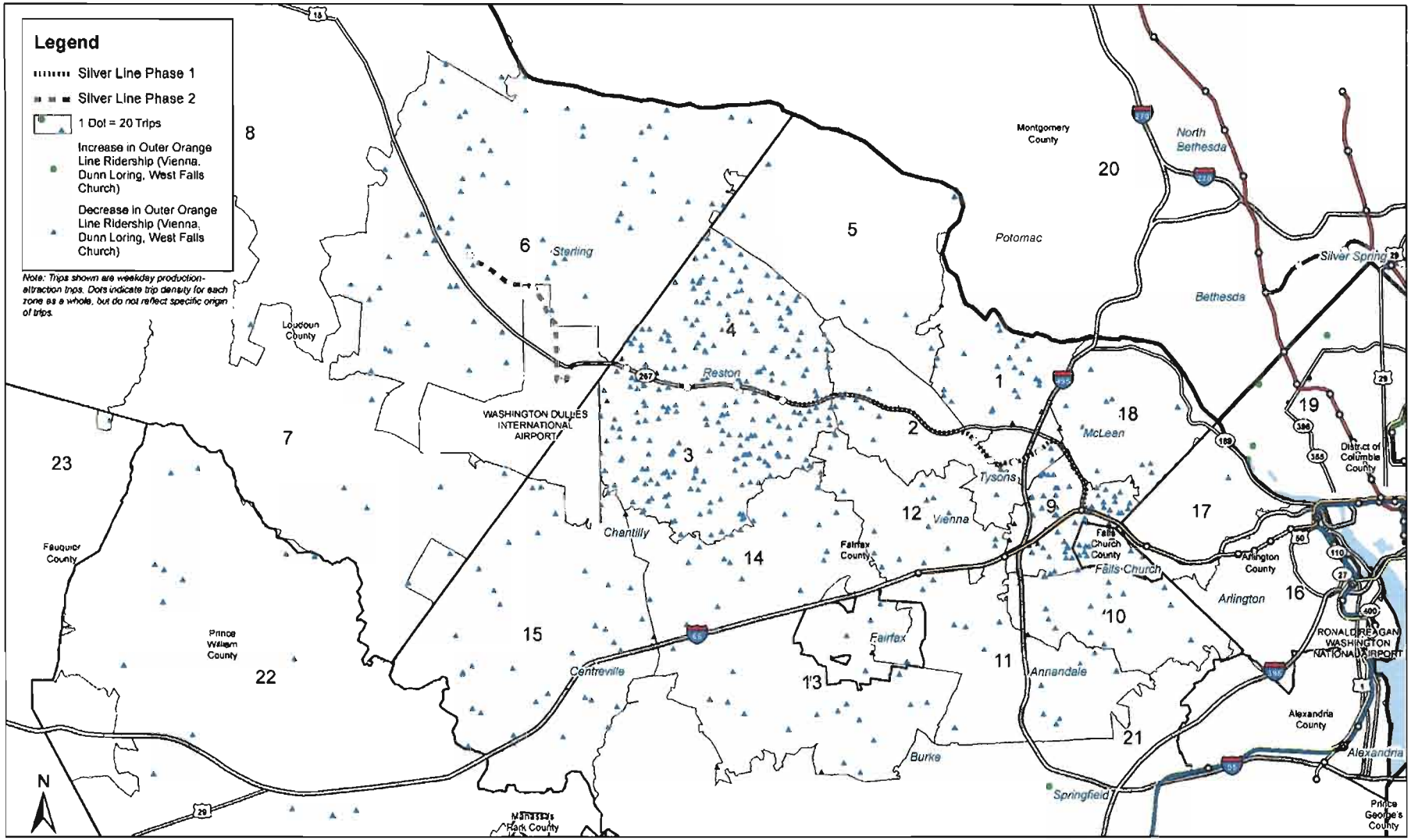


Figure A5: Metrorail Silver Line Trips by Zip Zone of Residence, Home-Based Work Only

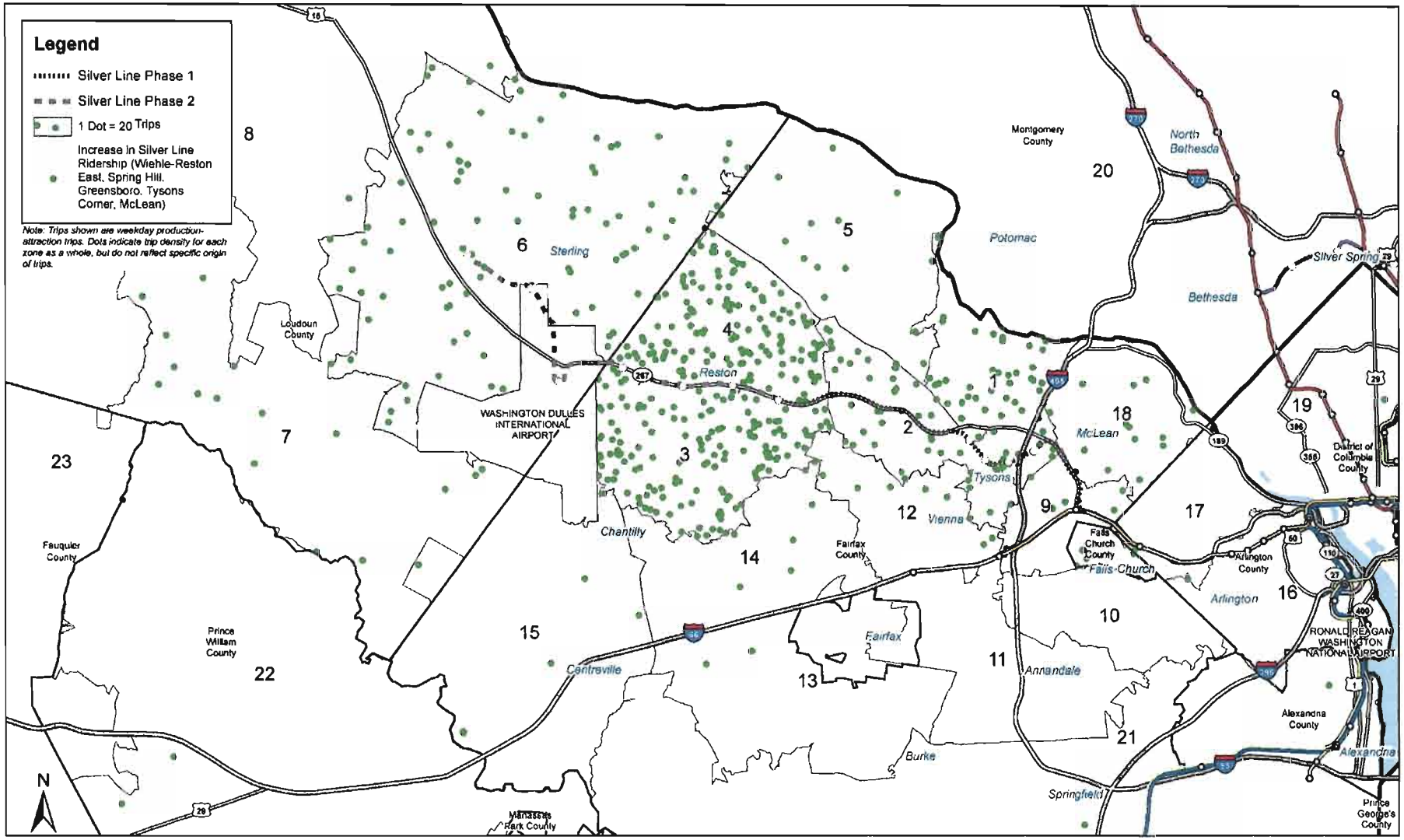


Figure A6: Change in Daily Metrorail Trips by Zip Code for Place of Residence, Home-Based Work Only, Park-and-Ride Access Only

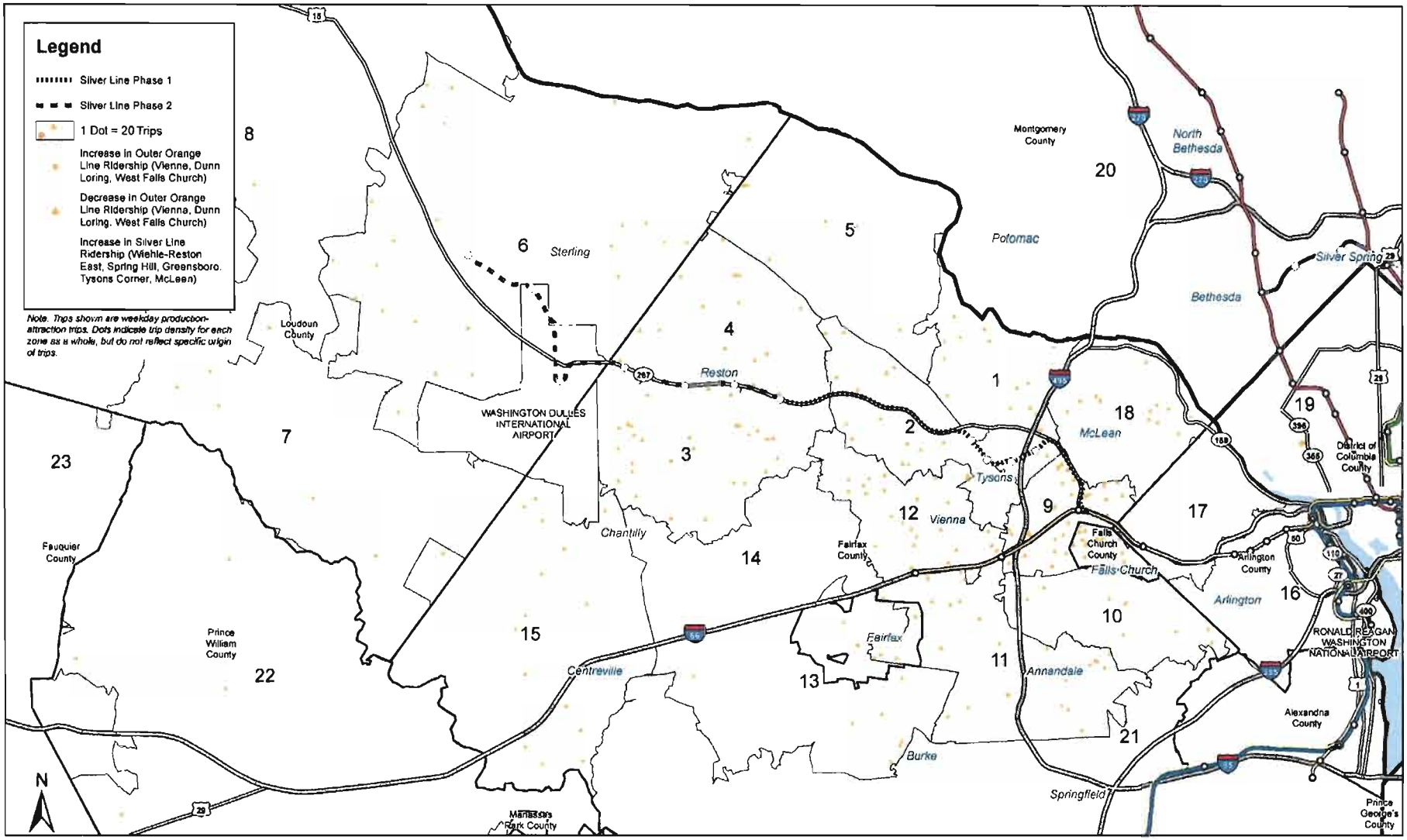
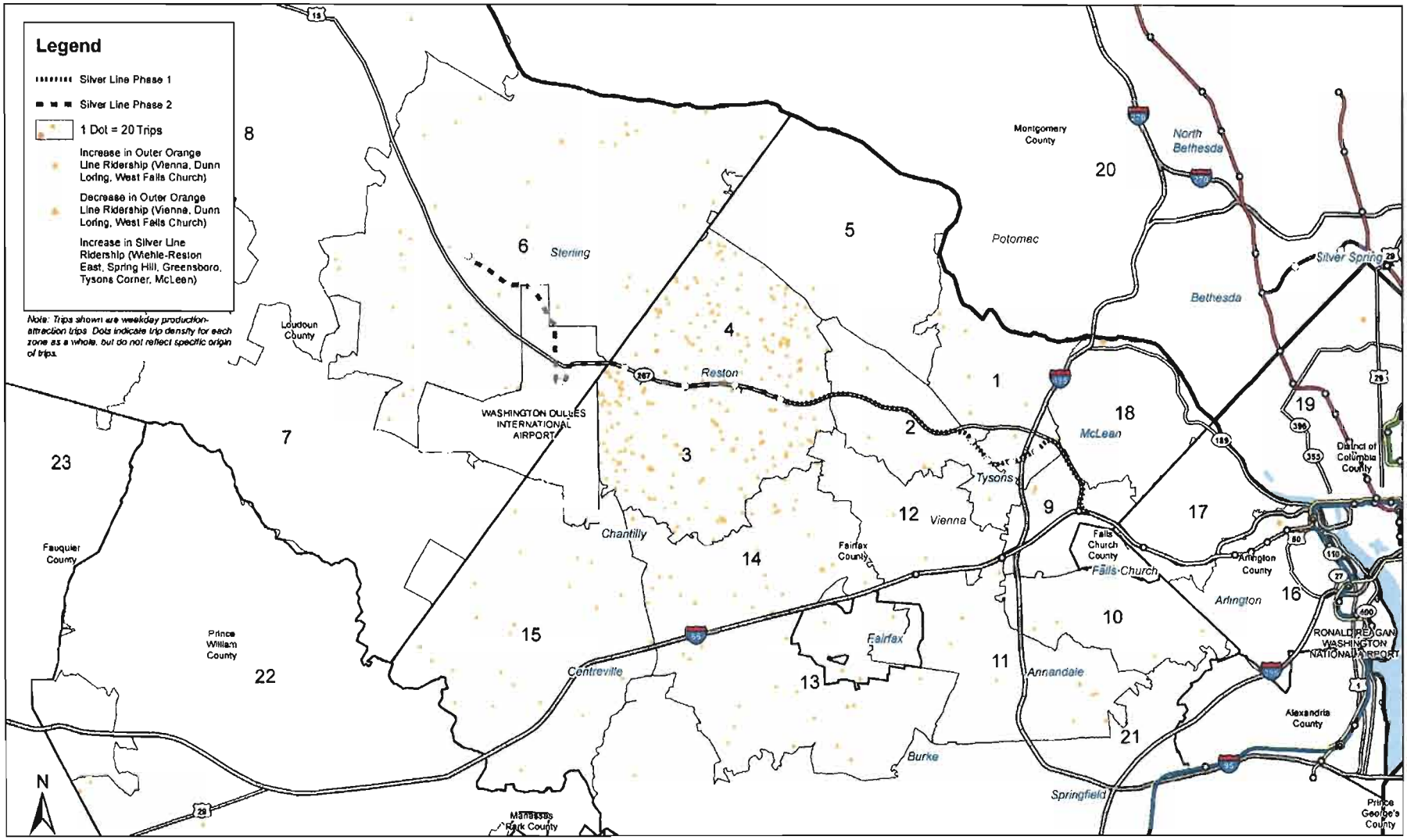


Figure A7: Change in Daily Metrorail Trips by Zip Code for Place of Residence, Home-Based Work Only, Bus Access Only



A5.2 Derivation of Headwind Adjustment

There was a broadly distributed decrease in Metrorail ridership; all station groups other than those including Silver Line stations observed a decrease in ridership between 2012 and 2016. This systemwide decrease in ridership can be attributed to various factors unrelated to the Project, including those that subsequently led to the systemwide SafeTrack rehabilitation program that began in mid-2016. This created a ridership "headwind" that disguises the true effect of the Project on transit ridership.

The systemwide transit headwind was not predicted by project travel demand forecasts prepared during project development and thus makes the comparison of projected project activity and actual project activity challenging. By adjusting ridership data to control for the effects of the headwind, the true effect of the project can be isolated, and compared against previous forecasts.

To estimate the ridership increases that would have theoretically occurred without this headwind, a multi-step process was undertaken. The first step was to subtract the change in project-related trips (production or attraction trips involving the Wiehle-Reston East, Tysons, Outer VA Orange, and WFC groups) from the After conditions system trip total. An adjustment factor was then calculated to scale the 2016 trips on the portion of the system unaffected by the Project total up to match the trip totals on the same portion of the system in 2012. Project-related trips in the After conditions were then scaled up by this factor and used to calculate the theoretical change in project-related trips. This process was iterated until the non-project-related before trip totals approximately matched the non-project-related after trip totals, and a final adjustment factor reached. **Table A1** shows that this was accomplished after five iterations, with a final adjustment factor of approximately 1.15. Using this adjustment factor, it was determined that the effect of the Project, once separated from ridership headwinds, is an increase in Metrorail ridership by approximately 12,000 riders.

Table A1: Derivation of Adjustment Factor to Remove "Headwind" Effects

Ridership Metric	Before	Iteration 0 After	Iteration 0 Less Proj. Net Effect	Iteration 1 After	Iteration 1 Less Proj. Net Effect	Iteration 2 After	Iteration 2 Less Proj. Net Effect	Iteration 3 After	Iteration 3 Less Proj. Net Effect	Iteration 4 After	Iteration 4 Less Proj. Net Effect	Iteration 5 After	Iteration 5 Less Proj. Net Effect
Total system entries	754,756	667,224	665,096	754,756	744,200	765,462	753,899	766,332	754,687	766,402	754,751	766,407	754,756
Adjustment factor	NA		1.1348		1.0142		1.0011		1.0001		1.0000		1.0000
Project-associated changes	Before	After	Delta	After	Delta	After	Delta	After	Delta	After	Delta	After	Delta
Project Prods	0	18,698	18,698	21,218	21,218	21,519	21,519	21,544	21,544	21,546	21,546	21,546	21,546
Project Attrs	0	10,790	10,790	12,245	12,245	12,418	12,418	12,433	12,433	12,434	12,434	12,434	12,434
Project Internals	0	1,604	-1,604	1,820	-1,820	1,846	-1,846	1,848	-1,848	1,848	-1,848	1,848	-1,848
Outer VA OR Prods	31,366	24,769	-6,597	28,108	-3,258	28,507	-2,859	28,539	-2,827	28,542	-2,824	28,542	-2,824
Outer VA OR Attrs	6,636	4,239	-2,397	4,810	-1,826	4,878	-1,758	4,884	-1,752	4,884	-1,752	4,884	-1,752
WFC Prods	17,748	4,908	-12,840	5,570	-12,178	5,649	-12,099	5,655	-12,093	5,656	-12,092	5,656	-12,092
WFC Attrs	4,645	724	-3,922	821	-3,824	833	-3,813	834	-3,812	834	-3,812	834	-3,812
Net effect of the project	60,396	65,732	2,128	2,415	10,556	11,980	11,563	13,122	11,645	13,214	11,651	13,222	11,652
Trips on the project itself	--	27,884	---	31,643	---	32,092	---	32,128	---	32,131	---	32,131	---

Overall adjusment factor

$$\frac{766{,}407}{667{,}224} = 1.14865$$

A5.3 Station Group to Station Group Ridership – With Headwind Adjustments

This section documents ridership numbers in which after conditions ridership data has been adjusted for headwind effects. For data that has not been adjusted, see Appendix 3.

A5.3.1 Adjusted Trips on the Project – After Conditions

The headwind adjustment factor was applied to faregate data from after conditions to assess the characteristics of ridership on the Project. Ridership data was aggregated by station-group to develop origin-destination matrices. On-board rail survey data was aggregated using the same station groups as the faregate data, weighted by station-group OD pair, and used to assess ridership patterns for various demographic characteristics. **Table A2** shows ridership by trip purpose. **Table A3** shows ridership by mode of access. **Table A4** shows ridership by income level. **Table A5** shows ridership by car ownership.

Table A2: Adjusted Trips on the Project by Trip Purpose

i. All Purposes			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
	2	Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
	3	Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
	4	Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
	5	McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
	6	Outer VA OR	101	20	18	112	48	*Trips Not on the Project*								299
	7	WFC	18	5	0	14	1									38
	8	Inner VA OR	768	247	410	1,054	300									2,780
	9	VA BL/Yellow	186	110	93	227	78									694
	10	Core OR/BL/SL	903	281	350	1,128	336									2,997
	11	Other Core	337	68	112	283	85									885
	12	East BL & OR	205	56	70	334	59									723
	13	Non-Core	623	227	255	758	273									2,135
Total			3,546	1,349	1,520	4,549	1,431	163	19	2,068	1,316	11,615	3,157	123	1,174	32,029

iii. Home-Based Other			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	0	7	169	15	47	0	130	110	785	485	30	80	1,860
	2	Spring Hill	0	0	0	7	0	13	0	8	9	75	11	0	0	124
	3	Greensboro	0	0	0	11	0	0	0	16	12	62	22	0	0	122
	4	Tysons Corner	11	0	0	0	0	0	0	87	68	224	32	0	36	458
	5	McLean	9	6	0	0	0	4	0	11	25	131	83	0	0	269
	6	Outer VA OR	16	0	0	23	0	*Trips Not on the Project*								39
	7	WFC	0	0	0	0	0									0
	8	Inner VA OR	45	0	29	221	12									307
	9	VA BL/Yellow	31	19	17	38	0									105
	10	Core OR/BL/SL	124	15	25	127	5									295
	11	Other Core	23	24	0	6	0									53
	12	East BL & OR	33	2	0	0	0									35
	13	Non-Core	121	42	23	169	14									370
Total			393	102	94	584	31	0	0	0	0	0	0	0	0	4,038

ii. Home-Based Work			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	176	105	202	95	8	0	1,141	603	6,534	1,678	20	544	11,106
	2	Spring Hill	31	0	0	11	0	3	0	16	39	495	62	28	12	697
	3	Greensboro	0	0	0	13	8	0	0	36	41	438	76	0	21	633
	4	Tysons Corner	124	47	0	0	8	4	0	100	10	650	95	0	42	1,080
	5	McLean	51	0	8	17	0	0	0	84	89	1,131	173	0	46	1,599
	6	Outer VA OR	77	9	11	66	37	*Trips Not on the Project*								200
	7	WFC	5	1	0	5	0									11
	8	Inner VA OR	657	165	352	784	270									2,228
	9	VA BL/Yellow	122	48	56	161	75									461
	10	Core OR/BL/SL	498	86	228	666	234									1,712
	11	Other Core	137	0	67	135	63									402
	12	East BL & OR	152	53	58	320	44									628
	13	Non-Core	418	106	225	528	226									1,502
Total			2,273	691	1,109	2,907	1,059	15	0	1,376	783	9,248	2,084	48	664	22,258

iv. Non-Home-Based			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	49	26	24	45	12	19	10	84	140	464	160	9	118	1,159
	2	Spring Hill	33	11	10	56	20	22	3	105	28	146	96	8	84	620
	3	Greensboro	29	7	13	24	10	18	0	70	16	121	20	12	21	362
	4	Tysons Corner	66	38	29	29	68	18	5	130	110	264	143	10	142	1,052
	5	McLean	2	24	16	54	14	5	1	51	16	96	21	5	28	334
	6	Outer VA OR	8	11	7	23	11	*Trips Not on the Project*								60
	7	WFC	12	4	0	10	1									28
	8	Inner VA OR	66	82	29	50	18									245
	9	VA BL/Yellow	33	43	20	28	3									128
	10	Core OR/BL/SL	281	179	97	336	98									990
	11	Other Core	176	44	45	142	22									430
	12	East BL & OR	20	1	12	14	14									60
	13	Non-Core	84	79	7	61	33									264
Total			859	549	310	871	325	82	19	440	310	1,090	440	44	393	5,732

Table A3: Adjusted Trips on the Project by Access Mode

i. All Access Modes

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
2	Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
3	Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
4	Tysons Corner	183	85	29	29	76	22	5	317	188	1,137	270	10	220	2,572
5	McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
6	Outer VA OR	101	20	18	112	48									299
7	WFC	18	5	0	14	1									38
8	Inner VA OR	768	247	410	1,054	300									2,780
9	VA BL/Yellow	186	110	93	227	78									694
10	Core OR/BL/SL	903	281	350	1,128	336									2,997
11	Other Core	337	68	112	283	85									885
12	East BL & OR	205	56	70	334	59									723
13	Non-Core	623	227	255	758	273									2,135
Total		3,527	1,349	1,520	4,549	1,431	163	19	2,068	1,316	11,615	3,157	123	1,174	32,010

Trips Not on the Project

ii. Walk

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	31	19	45	15	8	0	109	68	502	137	7	138	1,081
2	Spring Hill	29	0	0	11	12	13	0	34	28	302	0	0	12	441
3	Greensboro	7	0	0	13	8	0	0	12	30	275	25	0	23	393
4	Tysons Corner	14	11	0	0	16	2	0	172	109	526	139	6	98	1,093
5	McLean	16	6	8	44	0	4	0	67	48	499	89	0	45	826
6	Outer VA OR	4	7	0	54	37									102
7	WFC	0	0	0	5	0									5
8	Inner VA OR	476	133	325	846	255									2,034
9	VA BL/Yellow	59	59	60	81	56									316
10	Core OR/BL/SL	409	233	254	757	214									1,868
11	Other Core	135	35	104	169	66									503
12	East BL & OR	90	51	11	47	13									212
13	Non-Core	248	66	131	389	197									1,031
Total		1,488	631	912	2,457	889	29	0	394	282	2,104	390	13	316	9,905

Trips Not on the Project

iii. Bus

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	117	79	247	92	25	0	532	260	2,169	656	0	194	4,371
2	Spring Hill	31	0	0	8	0	0	0	0	11	104	0	28	22	204
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Tysons Corner	120	47	0	0	8	0	0	78	42	294	54	0	81	724
5	McLean	5	0	0	0	0	0	0	31	31	169	6	0	0	242
6	Outer VA OR	58	0	0	18	0									76
7	WFC	5	1	0	0	0									6
8	Inner VA OR	148	19	51	116	24									358
9	VA BL/Yellow	43	16	0	33	6									98
10	Core OR/BL/SL	196	34	37	128	37									432
11	Other Core	99	0	0	0	0									99
12	East BL & OR	48	0	6	126	16									196
13	Non-Core	176	52	43	217	32									519
Total		931	286	215	894	215	25	0	641	344	2,737	717	28	296	7,328

Trips Not on the Project

iv. Park & Ride

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	14	14	90	9	0	0	478	338	3,873	1,211	15	265	6,307
2	Spring Hill	0	0	0	34	0	0	0	0	16	124	23	0	0	197
3	Greensboro	0	0	0	0	0	0	0	0	12	132	31	0	6	181
4	Tysons Corner	12	0	0	0	0	2	0	37	0	228	23	0	13	315
5	McLean	0	0	0	0	0	0	0	23	6	419	51	0	0	499
6	Outer VA OR	0	3	0	0	0									3
7	WFC	0	0	0	0	0									0
8	Inner VA OR	0	0	0	12	4									17
9	VA BL/Yellow	16	7	0	31	6									61
10	Core OR/BL/SL	143	7	31	112	26									319
11	Other Core	16	0	0	41	16									73
12	East BL & OR	44	2	11	98	10									166
13	Non-Core	81	10	46	6	25									167
Total		312	43	101	424	97	2	0	538	372	4,776	1,339	15	284	8,304

Trips Not on the Project

v. Kiss & Ride

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	40	0	23	0	5	0	156	136	745	240	0	115	1,461
2	Spring Hill	0	0	0	0	0	3	0	16	0	91	40	0	12	161
3	Greensboro	0	0	0	0	0	0	0	34	0	181	38	0	6	259
4	Tysons Corner	12	0	0	0	8	0	0	11	5	83	20	0	0	138
5	McLean	16	0	0	0	0	0	0	4	24	176	131	0	19	371
6	Outer VA OR	16	0	0	0	0									16
7	WFC	0	0	0	0	0									0
8	Inner VA OR	99	49	12	12	0									172
9	VA BL/Yellow	28	9	0	0	0									38
10	Core OR/BL/SL	35	7	12	46	10									109
11	Other Core	0	0	8	50	0									58
12	East BL & OR	23	0	1	43	5									72
13	Non-Core	58	30	23	81	19									212
Total		286	135	55	256	42	8	0	221	165	1,277	469	0	153	3,067

Trips Not on the Project

vi. Other

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	0	24	11	6	36	10	79	52	493	78	37	30	906
2	Spring Hill	5	11	10	21	8	22	3	80	20	94	108	8	50	438
3	Greensboro	22	7	13	35	10	18	0	75	28	34	24	12	6	284
4	Tysons Corner	24	27	29	29	45	18	5	20	32	6	34	5	29	302
5	McLean	24	24	16	27	14	5	1	21	22	94	0	5	10	264
6	Outer VA OR	23	11	18	39	11									102
7	WFC	12	4	0	10	1									28
8	Inner VA OR	46	46	23	67	17									199
9	VA BL/Yellow	39	19	33	82	9									182
10	Core OR/BL/SL	119	0	17	85	49									269
11	Other Core	86	33	0	28	3									150
12	East BL & OR	0	3	40	19	14									77
13	Non-Core	60	69	12	65	0									206
Total		509	253	236	518	188	99	19	275	154	721	243	67	125	3,407

Trips Not on the Project

Table A4: Adjusted Trips on the Project by Income

i. All Incomes

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	157	112	390	122	56	0	1,199	793	6,712	1,853	33	633	12,084
2	Spring Hill	31	0	0	54	12	16	0	62	48	658	50	28	58	1,017
3	Greensboro	7	0	0	24	8	0	0	60	41	502	72	0	36	751
4	Tysons Corner	155	58	0	0	31	4	0	298	173	1,021	230	6	220	2,197
5	McLean	51	6	8	44	0	4	0	121	108	1,165	238	0	64	1,809
6	Outer VA OR	93	9	11	73	37									223
7	WFC	5	1	0	5	0									11
8	Inner VA OR	674	194	352	906	277									2,403
9	VA BL/Yellow	186	101	40	208	75									610
10	Core OR/BL/SL	810	234	329	1,120	312									2,805
11	Other Core	337	35	90	269	82									813
12	East BL & OR	205	55	57	329	49									696
13	Non-Core	546	146	236	681	266									1,875
Total		3,124	997	1,234	4,103	1,271	81	0	1,741	1,165	10,058	2,443	66	1,011	27,293

Trips Not on the Project

ii. <$50k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	40	14	87	14	42	0	75	45	547	203	7	89	1,187
2	Spring Hill	0	0	0	0	0	7	0	13	9	49	11	28	24	141
3	Greensboro	0	0	0	0	0	0	0	0	0	68	0	0	0	68
4	Tysons Corner	61	19	0	0	0	2	0	17	82	154	23	6	116	479
5	McLean	7	0	8	27	0	4	0	81	5	115	6	0	0	253
6	Outer VA OR	58	0	0	36	10									104
7	WFC	0	0	0	0	0									0
8	Inner VA OR	127	35	55	140	7									365
9	VA BL/Yellow	49	42	0	52	13									156
10	Core OR/BL/SL	142	94	14	200	33									483
11	Other Core	20	11	9	64	0									104
12	East BL & OR	88	53	46	176	15									379
13	Non-Core	171	63	30	323	104									691
Total		746	358	175	1,106	196	55	0	186	141	933	243	41	229	4,409

Trips Not on the Project

iii. $50k-$75k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	9	0	80	9	8	0	181	154	531	72	0	71	1,115
2	Spring Hill	0	0	0	8	0	3	0	0	11	44	0	0	12	78
3	Greensboro	0	0	0	24	0	0	0	38	0	80	5	0	4	151
4	Tysons Corner	80	0	0	0	0	0	0	122	45	229	43	0	13	532
5	McLean	0	0	0	17	0	0	0	0	55	81	0	0	41	194
6	Outer VA OR	0	0	0	2	0									2
7	WFC	0	1	0	5	0									5
8	Inner VA OR	147	13	65	159	19									404
9	VA BL/Yellow	81	0	0	71	19									171
10	Core OR/BL/SL	133	67	119	145	19									483
11	Other Core	113	0	25	23	19									179
12	East BL & OR	50	0	0	51	10									111
13	Non-Core	85	20	98	156	65									424
Total		689	109	307	741	161	11	0	341	265	965	119	0	141	3,850

Trips Not on the Project

iv. $75k-$100k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	0	0	58	15	0	0	212	92	875	134	0	165	1,552
2	Spring Hill	0	0	0	0	0	0	0	8	11	143	11	0	10	183
3	Greensboro	0	0	0	0	0	0	0	0	12	61	5	0	0	77
4	Tysons Corner	14	0	0	0	16	0	0	66	5	103	29	0	35	268
5	McLean	11	0	0	0	0	0	0	26	0	151	52	0	4	243
6	Outer VA OR	4	7	11	32	0									54
7	WFC	0	0	0	0	0									0
8	Inner VA OR	139	47	43	196	77									502
9	VA BL/Yellow	24	25	0	10	12									70
10	Core OR/BL/SL	131	0	44	212	76									464
11	Other Core	41	24	5	14	25									108
12	East BL & OR	18	0	0	21	13									52
13	Non-Core	59	52	39	42	50									242
Total		441	154	142	584	284	0	0	312	120	1,333	231	0	214	3,816

Trips Not on the Project

v. >$100k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	108	98	165	84	5	0	731	502	4,759	1,444	25	309	8,231
2	Spring Hill	31	0	0	45	12	7	0	41	16	423	27	0	12	615
3	Greensboro	7	0	0	0	8	0	0	23	30	293	62	0	32	455
4	Tysons Corner	0	40	0	0	16	2	0	92	42	535	136	0	56	918
5	McLean	33	6	0	0	0	0	0	15	48	817	180	0	19	1,119
6	Outer VA OR	31	3	0	2	27									63
7	WFC	5	0	0	0	0									5
8	Inner VA OR	261	99	188	411	174									1,134
9	VA BL/Yellow	32	34	40	75	31									212
10	Core OR/BL/SL	405	74	151	563	183									1,375
11	Other Core	163	0	52	168	39									422
12	East BL & OR	48	2	11	82	10									153
13	Non-Core	232	10	69	160	46									517
Total		1,248	375	610	1,672	630	14	0	902	638	6,827	1,850	25	428	15,219

Trips Not on the Project

Table A5: Adjusted Trips on the Project by Vehicles Ownership

i. All Levels of Ownership

Production Station-Group			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
	1	Wiehle	24	202	112	417	122	56	0	1,355	853	7,741	2,310	51	742	13,984
	2	Spring Hill	60	0	0	54	12	13	0	62	65	716	74	28	58	1,141
	3	Greensboro	7	0	0	24	8	0	0	66	53	616	98	0	36	908
	4	Tysons Corner	177	58	0	0	31	4	0	317	173	1,137	236	6	220	2,361
	5	McLean	60	6	8	44	0	4	0	129	114	1,358	278	0	64	2,065
	6	Outer VA OR	93	9	11	88	37									239
	7	WFC	5	1	0	5	0									11
	8	Inner VA OR	768	216	410	1,054	300									2,749
	9	VA BL/Yellow	186	101	78	227	75									666
	10	Core OR/BL/SL	903	281	350	1,128	336									2,997
	11	Other Core	337	35	112	283	82									848
	12	East BL & OR	205	55	58	329	49									697
	13	Non-Core	610	158	255	758	273									2,054
Total			3,435	1,122	1,393	4,411	1,326	78	0	1,930	1,258	11,568	2,995	84	1,120	30,719

Trips Not on the Project

iii. 1 Vehicle

Production Station-Group			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
	1	Wiehle	0	32	68	123	57	13	0	446	203	1,903	517	18	202	3,583
	2	Spring Hill	0	0	0	20	6	7	0	39	28	190	58	0	12	359
	3	Greensboro	7	0	0	11	8	0	0	50	0	141	55	0	6	279
	4	Tysons Corner	99	0	0	0	8	2	0	151	40	477	103	0	43	923
	5	McLean	25	6	0	27	0	4	0	50	23	424	89	0	7	655
	6	Outer VA OR	16	0	11	18	27									73
	7	WFC	5	0	0	0	0									5
	8	Inner VA OR	359	63	167	335	153									1,076
	9	VA BL/Yellow	52	66	38	89	6									251
	10	Core OR/BL/SL	275	112	151	349	75									962
	11	Other Core	137	24	30	69	12									272
	12	East BL & OR	78	0	41	165	16									300
	13	Non-Core	353	32	93	265	83									826
Total			1,407	335	599	1,470	452	26	0	736	294	3,135	821	18	271	9,563

Trips Not on the Project

ii. 0 Vehicles

Production Station-Group			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
	1	Wiehle	0	36	14	98	11	8	0	78	53	242	25	7	78	650
	2	Spring Hill	14	0	0	0	0	0	0	8	9	117	0	28	36	212
	3	Greensboro	0	0	0	13	0	0	0	0	0	99	0	0	13	125
	4	Tysons Corner	78	58	0	0	16	0	0	83	86	113	7	6	133	581
	5	McLean	5	0	3	17	0	0	0	56	12	68	6	0	18	186
	6	Outer VA OR	77	0	0	36	10									123
	7	WFC	0	1	0	5	0									5
	8	Inner VA OR	254	47	158	544	92									1,095
	9	VA BL/Yellow	74	17	0	74	62									227
	10	Core OR/BL/SL	234	62	157	545	184									1,182
	11	Other Core	83	11	64	122	47									328
	12	East BL & OR	51	53	6	66	18									194
	13	Non-Core	205	86	90	410	182									973
Total			1,076	371	492	1,929	622	8	0	225	161	639	38	41	278	5,881

Trips Not on the Project

iv. 2+ Vehicles

Production Station-Group			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
	1	Wiehle	24	133	29	196	54	35	0	831	597	5,595	1,769	25	463	9,751
	2	Spring Hill	46	0	0	34	6	7	0	16	28	409	16	0	10	570
	3	Greensboro	0	0	0	0	0	0	0	16	53	376	42	0	17	504
	4	Tysons Corner	0	0	0	0	8	2	0	83	47	547	126	0	43	857
	5	McLean	29	0	4	0	0	0	0	24	79	867	183	0	38	1,224
	6	Outer VA OR	0	9	0	34	0									43
	7	WFC	0	0	0	0	0									0
	8	Inner VA OR	155	106	85	175	56									577
	9	VA BL/Yellow	60	18	40	64	6									188
	10	Core OR/BL/SL	393	107	43	234	77									853
	11	Other Core	116	0	18	92	22									249
	12	East BL & OR	75	2	11	99	16									203
	13	Non-Core	52	40	72	84	7									255
Total			951	416	303	1,011	252	44	0	968	803	7,794	2,136	25	571	15,275

Trips Not on the Project

A5.3.2 Change in Adjusted Rail Trips – Station-Group to Station-Group

The headwind adjustment factor was applied to faregate data from after conditions to assess the characteristics of ridership on the Project. Ridership data was aggregated by station-group to develop origin-destination matrices. On-board rail survey data was aggregated using the same station groups as the faregate data, weighted by station-group OD pair, and used to assess ridership patterns for various demographic characteristics.

The tables included in this section show station-group to station-group ridership in before conditions, after conditions, and the change between before and after conditions. In this section, after conditions data is headwind-adjusted. For headwind-unadjusted data, see **A5.4** Station Group to Station Group Ridership – Without Headwind Adjustments.

Table A6 through **Table A9** show a before & after comparison of ridership by trip purpose. **Table A10** through **Table A15** show a before & after comparison of ridership by mode. **Table A16** through **Table A20** show a before & after comparison of ridership by income. **Table A21** through **Table A24** show a before & after comparison of ridership by car ownership. **Table A25** through **Table A29** show a before & after comparison of ridership by time of day.

Table A6: Adjusted Rail Trips by Trip Purpose – All Purposes – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					481	474	2,898	2,027	19,271	4,279	212	1,723	31,366
	7 WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
	8 Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
	9 VA BL/Yellow						625	406	3,058	24,911	51,306	24,754	780	9,680	115,519
	10 Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
	11 Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
	12 East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
	13 Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total		0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
	2 Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
	3 Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
	4 Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
	5 McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
	6 Outer VA OR	101	20	18	112	48	366	145	2,309	1,707	17,871	4,145	128	1,481	28,451
	7 WFC	18	5	0	14	1	109	19	352	189	3,831	780	33	286	5,638
	8 Inner VA OR	768	247	410	1,054	300	883	98	2,441	2,005	29,138	5,128	132	2,837	45,441
	9 VA BL/Yellow	186	110	93	227	78	296	97	1,936	23,369	49,148	26,776	616	9,553	113,987
	10 Core OR/BL/SL	903	281	350	1,128	336	1,266	223	5,909	10,162	42,932	12,208	2,708	9,827	88,232
	11 Other Core	337	68	112	283	85	398	96	1,773	8,912	21,671	34,045	798	25,443	94,021
	12 East BL & OR	205	56	70	334	59	423	50	1,380	3,865	27,912	6,680	3,430	7,151	51,613
	13 Non-Core	623	227	255	758	273	965	85	4,073	17,862	73,704	133,187	2,497	83,039	317,547
Total		###	1,349	1,520	###	1,431	4,869	831	22,240	69,388	277,822	227,608	10,465	140,790	766,407

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
	2 Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
	3 Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
	4 Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
	5 McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
	6 Outer VA OR	101	20	18	112	48	-116	-329	-589	-320	-1,400	-134	-84	-242	-2,915
	7 WFC	18	5	0	14	1	-253	-45	-1,515	-972	-6,733	1,765	-88	-777	-12,110
	8 Inner VA OR	768	247	410	1,054	300	-116	-619	-134	-582	2,396	-167	-199	71	3,429
	9 VA BL/Yellow	186	110	93	227	78	-328	-309	-1,127	1,542	-2,158	3,524	-164	-127	-1,532
	10 Core OR/BL/SL	903	281	350	1,128	336	-636	-987	-25	-359	-368	-966	-726	-2,467	-3,537
	11 Other Core	337	68	112	283	85	-419	-330	-33	1,139	-1,056	2,072	-53	-2,808	-606
	12 East BL & OR	205	56	70	334	59	59	-381	-79	33	-1,036	-764	-998	-1,951	-3,794
	13 Non-Core	623	227	255	758	273	-121	-832	-517	1,017	154	11,248	-1,351	-493	11,240
Total		3,546	1,349	1,520	4,549	1,431	-1,767	-3,814	-1,946	-275	1,414	16,205	-3,540	-7,020	11,651

Table A7: Adjusted Rail Trips by Trip Purpose – Home-Based Work

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR	*No Trips in Before Conditions*					294	282	2,125	1,664	16,475	2,998	131	1,219	25,189
7	WFC						189	0	1,592	934	9,153	1,879	88	701	14,535
8	Inner VA OR						566	555	1,162	1,751	20,743	3,463	169	1,689	30,097
9	VA BL/Yellow						357	324	1,969	17,670	40,912	17,106	338	6,130	84,806
10	Core OR/BL/SL						638	571	2,811	4,886	24,293	5,579	1,129	4,674	44,392
11	Other Core						306	265	1,011	4,393	14,648	17,448	306	13,200	51,578
12	East BL & OR						246	348	1,201	3,147	24,778	5,601	2,257	5,836	43,414
13	Non-Core						809	713	3,372	12,578	60,173	90,768	2,041	54,373	224,827
Total		0	0	0	0	0	3,405	3,057	15,241	46,834	211,176	144,843	6,460	87,821	518,837

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	176	105	202	95	8	0	1,141	603	6,534	1,678	20	544	11,106
2	Spring Hill	31	0	0	11	0	3	0	16	39	495	62	28	12	697
3	Greensboro	0	0	0	13	8	0	0	36	41	438	76	0	21	633
4	Tysons Corner	124	47	0	0	8	4	0	100	10	650	95	0	42	1,080
5	McLean	51	0	8	17	0	0	0	84	89	1,131	173	0	46	1,599
6	Outer VA OR	77	9	11	66	37	181	80	1,874	1,366	15,625	3,272	102	1,079	23,779
7	WFC	5	1	0	5	0	37	0	242	183	3,220	593	7	172	4,464
8	Inner VA OR	657	165	352	784	270	543	30	1,218	1,300	22,565	3,723	83	2,003	33,673
9	VA BL/Yellow	122	48	56	161	75	177	14	1,170	16,012	38,557	21,655	364	6,244	84,655
10	Core OR/BL/SL	498	86	228	666	234	628	59	3,270	4,447	24,243	5,715	1,153	4,222	45,450
11	Other Core	137	0	67	135	63	208	15	1,080	5,080	13,363	18,921	390	12,529	51,988
12	East BL & OR	152	53	58	320	44	328	15	1,205	3,264	23,138	5,135	2,021	4,975	40,708
13	Non-Core	418	106	225	528	226	682	46	3,285	13,387	59,015	98,961	1,174	53,742	231,793
Total		###	691	1,109	###	1,059	2,800	259	14,719	45,823	208,973	160,059	5,322	85,630	531,624

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	176	105	202	95	8	0	1,141	603	6,534	1,678	20	544	11,106
2	Spring Hill	31	0	0	11	0	3	0	16	39	495	62	28	12	697
3	Greensboro	0	0	0	13	8	0	0	36	41	438	76	0	21	633
4	Tysons Corner	124	47	0	0	8	4	0	100	10	650	95	0	42	1,080
5	McLean	51	0	8	17	0	0	0	84	89	1,131	173	0	46	1,599
6	Outer VA OR	77	9	11	66	37	-113	-202	-251	-298	-850	274	-29	-140	-1,410
7	WFC	5	1	0	5	0	-152	0	-1,350	-752	5,933	-1,286	-81	-529	-10,077
8	Inner VA OR	657	165	352	784	270	-23	-525	56	-451	1,822	260	-106	315	3,478
9	VA BL/Yellow	122	48	56	161	75	-180	-310	-799	-1,658	-2,355	4,583	26	114	-151
10	Core OR/BL/SL	498	86	228	666	234	-11	-512	459	249	-50	336	24	-451	1,058
11	Other Core	137	0	67	135	63	-97	-250	69	687	-1,284	1,473	83	-672	410
12	East BL & OR	152	53	58	320	44	82	-333	4	117	-1,641	-466	-236	-862	-2,706
13	Non-Core	418	106	225	528	226	-127	-667	-87	809	-1,158	8,192	-867	-631	6,966
Total		2,273	691	1,109	2,907	1,059	-605	-2,799	-522	-1,011	-2,202	15,216	-1,138	-2,192	12,787

Trips on the project = 22,258

Table A8: Adjusted Rail Trips by Trip Purpose – Home-Based Other

Before

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	6	Outer VA OR	*No Trips in Before Conditions*					106	171	630	268	2,275	1,002	50	383	4,885
	7	WFC						118	0	164	143	1,064	534	5	189	2,217
	8	Inner VA OR						261	67	1,000	534	4,325	1,295	76	598	8,156
	9	VA BL/Yellow						139	33	657	3,799	6,168	4,961	188	2,012	17,958
	10	Core OR/BL/SL						251	199	1,026	1,564	6,214	2,104	803	2,292	14,454
	11	Other Core						148	24	325	1,085	2,600	5,679	166	5,335	15,364
	12	East BL & OR						63	69	176	530	3,196	1,413	1,564	2,040	9,051
	13	Non-Core						109	111	831	2,916	8,873	22,744	1,184	18,946	55,714
Total			0	0	0	0	0	1,194	675	4,810	10,840	34,715	39,733	4,038	31,795	127,798

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff	-10%

After

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	0	0	7	169	15	47	0	130	110	785	485	30	80	1,860
	2	Spring Hill	0	0	0	7	0	13	0	8	9	75	11	0	0	124
	3	Greensboro	0	0	0	11	0	0	0	16	12	62	22	0	0	122
	4	Tysons Corner	11	0	0	0	0	0	0	87	68	224	32	0	36	458
	5	McLean	9	6	0	0	0	4	0	11	25	131	83	0	0	269
	6	Outer VA OR	16	0	0	23	0	93	28	352	295	1,495	650	0	223	3,176
	7	WFC	0	0	0	0	0	62	0	69	0	418	148	13	76	786
	8	Inner VA OR	45	0	29	221	12	227	26	774	425	4,219	866	40	525	7,410
	9	VA BL/Yellow	31	19	17	38	0	78	48	542	3,233	6,200	4,506	136	1,993	16,842
	10	Core OR/BL/SL	124	15	25	127	5	167	35	858	1,609	6,583	1,819	634	1,988	13,988
	11	Other Core	23	24	0	6	0	61	28	263	1,362	2,379	5,238	147	4,560	14,089
	12	East BL & OR	33	2	0	0	0	37	0	132	406	3,174	1,239	945	1,595	7,561
	13	Non-Core	121	42	23	169	14	184	13	476	2,941	9,275	23,996	893	19,389	57,537
Total			413	108	101	771	46	973	178	3,717	10,495	35,021	39,095	2,838	30,466	124,223

Change

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	0	0	7	169	15	47	0	130	110	785	485	30	80	1,860
	2	Spring Hill	0	0	0	7	0	13	0	8	9	75	11	0	0	124
	3	Greensboro	0	0	0	11	0	0	0	16	12	62	22	0	0	122
	4	Tysons Corner	11	0	0	0	0	0	0	87	68	224	32	0	36	458
	5	McLean	9	6	0	0	0	4	0	11	25	131	83	0	0	269
	6	Outer VA OR	16	0	0	23	0	-13	-143	-278	27	-780	-352	-50	-159	-1,710
	7	WFC	0	0	0	0	0	-56	0	-95	-143	-646	-386	8	-112	-1,431
	8	Inner VA OR	45	0	29	221	12	-34	-41	-226	-109	-105	-428	-36	-73	-746
	9	VA BL/Yellow	31	19	17	38	0	-60	15	-115	-566	32	-456	-52	-19	-1,116
	10	Core OR/BL/SL	124	15	25	127	5	-84	-165	-168	45	369	-285	-170	-304	-466
	11	Other Core	23	24	0	6	0	-87	4	-63	276	-222	-442	-19	-776	-1,275
	12	East BL & OR	33	2	0	0	0	-27	-69	-45	-124	-22	-174	-620	-444	-1,489
	13	Non-Core	121	42	23	169	14	75	-98	-355	25	402	1,252	-292	443	1,823
Total			413	108	101	771	46	-221	-497	-1,093	-345	307	-638	-1,200	-1,329	-3,575

Trips on the project = 4,038

Table A9: Adjusted Rail Trips by Trip Purpose – Non-Home-Based

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						82	22	143	95	521	278	31	122	1,292
7	WFC						55	65	111	84	348	131	29	173	996
8	Inner VA OR						172	95	413	302	1,675	537	86	479	3,759
9	VA BL/Yellow	*No Trips in Before Conditions*					129	49	432	3,441	4,225	2,687	254	1,538	12,755
10	Core OR/BL/SL						1,013	439	2,097	4,262	12,793	5,491	1,500	5,328	32,924
11	Other Core						363	137	469	2,298	5,479	8,845	378	9,715	27,685
12	East BL & OR						55	14	82	155	973	430	607	626	2,943
13	Non-Core						169	93	387	1,351	4,503	8,427	623	10,214	25,766
Total		0	0	0	0	0	2,037	913	4,134	11,989	30,518	26,827	3,508	28,195	108,120

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	26	24	45	12	19	10	84	140	464	160	9	118	1,159
2	Spring Hill	33	11	10	56	20	22	3	105	28	146	96	8	84	620
3	Greensboro	29	7	13	24	10	18	0	70	16	121	20	12	21	362
4	Tysons Corner	66	38	29	29	68	18	5	130	110	264	143	10	142	1,052
5	McLean	2	24	16	54	14	5	1	51	16	96	21	5	28	334
6	Outer VA OR	8	11	7	23	11	92	37	82	46	751	223	26	179	1,497
7	WFC	12	4	0	10	1	10	19	41	6	194	39	14	38	388
8	Inner VA OR	66	82	29	50	18	113	42	449	280	2,354	538	28	308	4,358
9	VA BL/Yellow	33	43	20	28	3	41	35	224	4,123	4,391	2,117	116	1,315	12,490
10	Core OR/BL/SL	281	179	97	336	98	471	129	1,781	4,106	12,106	4,674	920	3,617	28,794
11	Other Core	176	44	45	142	22	129	53	430	2,470	5,929	9,886	262	8,355	27,944
12	East BL & OR	20	1	12	14	14	58	35	44	194	1,600	307	465	581	3,344
13	Non-Core	84	79	7	61	33	99	26	312	1,534	5,414	10,230	430	9,908	28,217
Total		859	549	310	871	325	1,096	395	3,803	13,071	33,828	28,454	2,305	24,694	110,560

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	26	24	45	12	19	10	84	140	464	160	9	118	1,159
2	Spring Hill	33	11	10	56	20	22	3	105	28	146	96	8	84	620
3	Greensboro	29	7	13	24	10	18	0	70	16	121	20	12	21	362
4	Tysons Corner	66	38	29	29	68	18	5	130	110	264	143	10	142	1,052
5	McLean	2	24	16	54	14	5	1	51	16	96	21	5	28	334
6	Outer VA OR	8	11	7	23	11	11	16	-60	-48	229	-56	-5	57	204
7	WFC	12	4	0	10	1	-44	-45	-71	-78	-155	-93	-15	-136	-608
8	Inner VA OR	66	82	29	50	18	-59	-53	36	-22	679	2	-58	-170	599
9	VA BL/Yellow	33	43	20	28	3	-88	-34	-208	682	166	569	-138	-222	-265
10	Core OR/BL/SL	281	179	97	336	98	-541	-310	-316	-156	-688	-817	-580	-1,711	-4,130
11	Other Core	176	44	45	142	22	-235	-84	-39	172	450	1,041	-117	-1,360	258
12	East BL & OR	20	1	12	14	14	4	21	-38	39	627	-124	-142	-45	401
13	Non-Core	84	79	7	61	33	-70	-67	-75	184	911	1,803	-193	-305	2,451
Total		859	549	310	871	325	-941	-518	-331	1,082	3,310	1,628	-1,203	-3,500	2,439

Table A10: Adjusted Rail Trips by Access Mode – All Access Modes

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR	*No Trips in Before Conditions*					482	474	2,898	2,027	19,271	4,279	212	1,723	31,366
7	WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
8	Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
9	VA BL/Yellow						625	406	3,058	24,911	51,306	24,754	780	9,680	115,519
10	Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
11	Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
12	East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
13	Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total		0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
2	Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
3	Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
4	Tysons Corner	183	85	29	29	76	22	5	317	188	1,137	270	10	220	2,572
5	McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
6	Outer VA OR	101	20	18	112	48	366	145	2,309	1,707	17,871	4,145	128	1,481	28,451
7	WFC	18	5	0	14	1	109	19	352	199	3,831	780	33	286	5,638
8	Inner VA OR	768	247	410	1,054	300	883	98	2,441	1,995	29,138	5,128	132	2,837	45,431
9	VA BL/Yellow	186	110	93	227	78	296	97	1,936	23,355	49,135	28,278	616	9,553	113,959
10	Core OR/BL/SL	903	281	350	1,128	336	1,266	223	5,909	10,162	42,932	12,208	2,708	9,827	88,232
11	Other Core	337	68	112	283	85	398	96	1,773	8,912	21,671	34,045	798	25,443	94,021
12	East BL & OR	205	56	70	334	59	423	50	1,380	3,865	27,912	6,680	3,430	7,151	51,613
13	Non-Core	623	227	255	758	273	965	85	4,073	17,862	73,704	133,160	2,497	83,002	317,483
Total		3,527	1,349	1,520	4,549	1,431	4,869	831	22,240	69,363	277,809	227,581	10,465	140,753	766,286

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
2	Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
3	Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
4	Tysons Corner	183	85	29	29	76	22	5	317	188	1,137	270	10	220	2,572
5	McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
6	Outer VA OR	101	20	18	112	48	-116	-329	-589	-320	-1,400	-134	-84	-242	-2,915
7	WFC	18	5	0	14	1	-253	-45	-1,115	-972	-6,733	-1,765	-88	-777	-12,110
8	Inner VA OR	768	247	410	1,054	300	-116	-619	-134	-593	2,396	-167	-199	71	3,418
9	VA BL/Yellow	186	110	93	227	78	-328	-309	-1,123	-1,556	-2,171	3,524	-164	-127	-1,560
10	Core OR/BL/SL	903	281	350	1,128	336	-636	-987	-25	-359	-368	-966	-726	-2,467	-3,537
11	Other Core	337	68	112	283	85	-419	-330	-33	1,139	-1,056	2,072	-53	2,808	-606
12	East BL & OR	205	56	70	334	59	59	-381	-79	33	-1,036	-764	-998	1,351	-3,794
13	Non-Core	623	227	255	758	273	-121	-832	-517	1,017	154	11,221	-1,351	-530	11,176
Total		3,527	1,349	1,520	4,549	1,431	-1,767	-3,814	-1,946	-299	1,400	16,179	-3,540	-7,058	11,530

Table A11: Adjusted Rail Trips by Access Mode -- Walk

Before

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	6	Outer VA OR	*No Trips in Before Conditions*					86	138	677	402	3,226	701	46	312	5,588
	7	WFC						19	0	237	155	775	254	0	98	1,538
	8	Inner VA OR						687	509	1,884	2,015	17,477	3,386	151	1,875	27,983
	9	VA BL/Yellow						244	89	1,128	7,849	17,699	8,782	170	3,259	39,219
	10	Core OR/BL/SL						1,281	740	4,127	6,972	31,431	9,101	2,102	8,585	64,339
	11	Other Core						457	298	1,263	4,969	14,217	20,787	521	20,247	62,759
	12	East BL & OR						34	84	156	641	3,224	1,261	1,051	2,239	8,691
	13	Non-Core						484	545	2,007	6,814	28,541	55,518	1,614	41,559	137,082
		Total	0	0	0	0	0	3,291	2,403	11,478	29,817	116,592	99,790	5,654	78,175	347,200

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	0	31	19	45	15	8	0	109	68	502	137	7	138	1,081
	2	Spring Hill	29	0	0	11	12	13	0	34	28	302	0	0	12	441
	3	Greensboro	7	0	0	13	8	0	0	12	30	275	25	0	23	393
	4	Tysons Corner	14	11	0	0	16	2	0	172	109	526	139	6	98	1,093
	5	McLean	16	6	8	44	0	4	0	67	48	499	89	0	45	826
	6	Outer VA OR	4	7	0	54	37	208	27	624	510	4,152	838	47	409	6,916
	7	WFC	0	0	0	5	0	33	0	44	6	911	128	7	176	1,309
	8	Inner VA OR	476	133	325	846	255	530	48	1,992	1,522	20,380	3,252	21	2,014	31,793
	9	VA BL/Yellow	59	59	60	81	56	90	0	991	8,351	19,985	11,110	193	3,798	44,833
	10	Core OR/BL/SL	409	233	254	757	214	545	86	3,885	5,741	31,789	7,778	642	4,897	57,230
	11	Other Core	135	35	104	163	66	136	28	1,194	5,168	13,704	21,169	418	15,436	57,758
	12	East BL & OR	90	51	11	47	13	61	0	255	775	4,634	1,307	777	1,927	9,949
	13	Non-Core	248	66	131	389	197	412	33	2,009	8,033	30,981	63,195	908	40,095	146,697
		Total	1,488	631	912	2,457	889	2,044	222	11,389	30,389	128,638	109,167	3,025	69,068	360,319

Change

Production Station-Group			Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	0	31	19	45	15	8	0	109	68	502	137	7	138	1,081
	2	Spring Hill	29	0	0	11	12	13	0	34	28	302	0	0	12	441
	3	Greensboro	7	0	0	13	8	0	0	12	30	275	25	0	23	393
	4	Tysons Corner	14	11	0	0	16	2	0	172	109	526	139	6	98	1,093
	5	McLean	16	6	8	44	0	4	0	67	48	499	89	0	45	826
	6	Outer VA OR	4	7	0	54	37	122	-111	-53	108	925	137	1	97	1,328
	7	WFC	0	0	0	5	0	14	0	-192	-149	136	-126	7	78	-229
	8	Inner VA OR	476	133	325	846	255	-157	-461	108	-492	3,905	-134	-129	139	4,828
	9	VA BL/Yellow	59	59	60	81	56	-154	-89	-137	502	2,285	2,328	23	539	4,810
	10	Core OR/BL/SL	409	233	254	757	214	-736	-654	-242	1,231	357	-1,323	-1,460	3,688	-7,109
	11	Other Core	135	35	104	163	66	-320	-270	-69	199	-513	382	-103	-4,811	-5,001
	12	East BL & OR	90	51	11	47	13	27	-84	100	134	1,670	47	-275	-312	1,257
	13	Non-Core	248	66	131	389	197	-72	-513	2	1,220	2,440	7,677	706	-1,464	9,615
		Total	1,488	631	912	2,457	889	-1,247	-2,181	-89	572	12,047	9,377	-2,629	-9,107	13,119

Trips on the project = 9,905

Table A12: Adjusted Rail Trips by Access Mode – Bus

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						299	249	872	540	3,465	743	74	419	6,660
7	WFC						307	0	1,361	643	4,974	1,099	87	509	8,980
8	Inner VA OR						139	95	261	276	2,884	411	120	261	4,448
9	VA BL/Yellow						211	157	857	5,147	13,708	6,147	226	2,842	29,296
10	Core OR/BL/SL	*No Trips in Before Conditions*					325	226	1,085	2,217	5,678	1,741	613	1,952	13,835
11	Other Core						52	35	57	692	1,121	2,309	252	3,199	7,716
12	East BL & OR						78	163	375	890	4,697	1,719	2,911	3,191	14,024
13	Non-Core						305	267	1,034	3,632	12,965	20,372	1,570	23,334	63,480
	Total	0	0	0	0	0	1,716	1,191	5,901	14,036	49,493	34,541	5,854	35,706	148,438

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	117	79	247	92	25	0	532	260	2,169	656	0	194	4,371
2	Spring Hill	31	0	0	8	0	0	0	0	11	104	0	28	22	204
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Tysons Corner	120	47	0	0	8	0	0	78	42	294	54	0	81	724
5	McLean	5	0	0	0	0	0	0	31	31	169	6	0	0	242
6	Outer VA OR	58	0	0	18	0	72	50	594	413	2,397	642	24	274	4,542
7	WFC	5	1	0	0	0	44	0	127	47	517	103	6	38	888
8	Inner VA OR	148	19	51	116	24	196	24	313	187	2,903	551	33	252	4,817
9	VA BL/Yellow	43	16	0	33	6	72	48	422	4,928	11,094	6,541	212	2,620	26,035
10	Core OR/BL/SL	196	34	37	128	37	240	18	1,191	2,250	4,987	1,707	976	2,207	14,008
11	Other Core	99	0	0	0	0	77	15	90	1,071	1,258	2,608	303	3,599	8,920
12	East BL & OR	48	0	6	126	16	149	0	291	961	4,768	1,322	2,258	2,814	12,759
13	Non-Core	176	52	43	217	32	306	20	694	3,979	11,738	20,620	1,070	23,662	62,608
	Total	931	286	215	894	215	1,181	174	4,362	14,180	42,398	34,810	4,709	35,762	140,118

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	117	79	247	92	25	0	532	260	2,169	656	0	194	4,371
2	Spring Hill	31	0	0	8	0	0	0	0	11	104	0	28	22	204
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Tysons Corner	120	47	0	0	8	0	0	78	42	294	54	0	81	724
5	McLean	5	0	0	0	0	0	0	31	31	169	6	0	0	242
6	Outer VA OR	58	0	0	18	0	-227	199	277	-127	1,068	-101	-50	-145	-1,117
7	WFC	5	1	0	0	0	-262	0	-1,234	-596	-4,457	-996	-81	-471	-8,092
8	Inner VA OR	148	19	51	116	24	57	-71	52	-89	19	140	-88	-9	369
9	VA BL/Yellow	43	16	0	33	6	-139	-108	-435	-219	-2,515	393	-15	-222	-3,261
10	Core OR/BL/SL	196	34	37	128	37	85	-208	106	34	-690	-33	363	255	172
11	Other Core	99	0	0	0	0	25	-21	34	379	137	299	-149	401	1,204
12	East BL & OR	48	0	6	126	16	71	-163	-84	71	71	-397	-652	-377	-1,265
13	Non-Core	176	52	43	217	32	1	247	340	347	-1,227	248	501	328	871
	Total	931	286	215	894	215	-534	-1,017	-1,538	144	-7,094	269	-1,145	56	-8,319

Trips on the project = 7,328

Table A13: Adjusted Rail Trips by Access Mode – Park and Ride

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					47	36	966	856	10,182	2,313	59	595	15,055
	7 WFC						0	16	160	230	3,760	1,010	9	286	5,471
	8 Inner VA OR						32	0	154	100	3,527	903	41	256	5,013
	9 VA BL/Yellow						0	33	440	7,253	11,777	6,067	205	1,616	27,392
	10 Core OR/BL/SL						153	46	110	489	2,695	580	415	716	5,203
	11 Other Core						45	22	77	444	951	959	78	925	3,501
	12 East BL & OR						141	106	707	1,782	17,482	3,680	147	1,933	25,978
	13 Non-Core						78	26	1,088	4,637	24,857	35,040	170	9,430	75,327
Total		0	0	0	0	0	497	286	3,703	15,792	75,231	50,552	1,123	15,756	162,939

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	14	14	90	9	0	0	478	338	3,873	1,211	15	265	6,307
	2 Spring Hill	0	0	0	34	0	0	0	0	16	124	23	0	0	197
	3 Greensboro	0	0	0	0	0	0	0	0	12	132	31	0	6	181
	4 Tysons Corner	12	0	0	0	0	2	0	37	0	228	23	0	13	315
	5 McLean	0	0	0	0	0	0	0	23	6	419	51	0	0	499
	6 Outer VA OR	0	3	0	0	0	0	19	793	473	9,009	2,125	20	511	12,953
	7 WFC	0	0	0	0	0	9	0	102	71	1,708	428	7	38	2,363
	8 Inner VA OR	0	0	0	12	4	35	0	46	117	3,398	763	21	222	4,619
	9 VA BL/Yellow	16	7	0	31	6	32	0	194	5,685	10,047	6,423	76	1,299	23,817
	10 Core OR/BL/SL	143	7	31	112	26	301	67	262	867	2,236	540	680	1,479	6,750
	11 Other Core	16	0	0	41	16	64	25	77	599	802	1,170	183	2,003	4,970
	12 East BL & OR	44	2	11	98	10	105	0	583	1,679	15,432	3,268	93	1,186	22,513
	13 Non-Core	81	10	46	6	25	65	0	799	3,784	23,923	36,219	126	8,835	73,917
Total		312	43	101	424	97	612	116	3,393	13,617	71,331	52,276	1,221	15,856	159,401

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	14	14	90	9	0	0	478	338	3,873	1,211	15	265	6,307
	2 Spring Hill	0	0	0	34	0	0	0	0	16	124	23	0	0	197
	3 Greensboro	0	0	0	0	0	0	0	0	12	132	31	0	6	181
	4 Tysons Corner	12	0	0	0	0	2	0	37	0	228	23	0	13	315
	5 McLean	0	0	0	0	0	0	0	23	6	419	51	0	0	499
	6 Outer VA OR	0	3	0	0	0	-47	-17	-173	-383	-1,173	-188	-39	-84	-2,103
	7 WFC	0	0	0	0	0	9	-16	-58	-159	-2,052	-581	-3	-248	-3,108
	8 Inner VA OR	0	0	0	12	4	3	0	-108	17	-129	140	-19	-34	-394
	9 VA BL/Yellow	16	7	0	31	6	32	-33	-246	-1,568	-1,710	356	-129	-317	-3,575
	10 Core OR/BL/SL	143	7	31	112	26	148	21	152	378	-459	-39	265	763	1,547
	11 Other Core	16	0	0	41	16	19	7	0	125	-149	211	105	1,079	1,469
	12 East BL & OR	44	2	11	98	10	-36	-106	-124	-103	-2,050	-412	-53	-747	-3,465
	13 Non-Core	81	10	46	6	25	-13	-26	-289	-953	-935	1,178	-44	-595	-1,410
Total		312	43	101	424	97	115	-170	-309	-2,176	-3,900	1,724	98	101	-3,539

Trips on the project = 8,304

Table A14: Adjusted Rail Trips by Access Mode – Kiss and Ride – Before Conditions

Before			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6	Outer VA OR	*No Trips in Before Conditions*					22	20	232	105	1,780	335	21	214	2,729
	7	WFC						27	0	19	53	633	108	9	77	927
	8	Inner VA OR						69	54	141	88	1,950	434	10	158	2,903
	9	VA BL/Yellow						74	75	133	1,485	3,113	1,834	83	899	7,696
	10	Core OR/BL/SL						55	62	320	304	1,529	384	72	467	3,192
	11	Other Core						12	19	13	50	344	466	0	468	1,371
	12	East BL & OR						58	35	157	375	2,781	600	168	895	5,069
	13	Non-Core						156	74	323	1,128	5,248	7,573	291	4,557	19,350
Total			0	0	0	0	0	472	338	1,337	3,588	17,377	11,734	655	7,736	43,237

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	40	0	23	0	5	0	156	136	745	240	0	115	1,461
	2	Spring Hill	0	0	0	0	0	3	0	16	0	91	40	0	12	161
	3	Greensboro	0	0	0	0	0	0	0	34	0	181	38	0	6	259
	4	Tysons Corner	12	0	0	0	8	0	0	11	5	83	20	0	0	138
	5	McLean	16	0	0	0	0	0	0	4	24	176	131	0	19	371
	6	Outer VA OR	16	0	0	0	0	13	0	168	145	1,626	350	11	148	2,478
	7	WFC	0	0	0	0	0	0	0	77	41	367	64	0	17	515
	8	Inner VA OR	99	49	12	12	0	63	0	45	58	1,467	347	40	213	2,405
	9	VA BL/Yellow	28	9	0	0	0	46	0	77	1,244	2,961	1,819	91	624	6,900
	10	Core OR/BL/SL	35	7	12	46	10	58	0	158	289	1,334	431	130	646	3,155
	11	Other Core	0	0	8	50	0	0	0	20	245	177	442	26	862	1,830
	12	East BL & OR	23	0	1	43	5	61	15	210	305	2,256	583	233	906	4,640
	13	Non-Core	58	30	23	81	19	96	7	378	999	4,392	8,029	311	4,728	19,151
Total			286	135	55	256	42	345	22	1,302	3,490	15,856	12,536	842	8,296	43,463

Change			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	40	0	23	0	5	0	156	136	745	240	0	115	1,461
	2	Spring Hill	0	0	0	0	0	3	0	16	0	91	40	0	12	161
	3	Greensboro	0	0	0	0	0	0	0	34	0	181	38	0	6	259
	4	Tysons Corner	12	0	0	0	8	0	0	11	5	83	20	0	0	138
	5	McLean	16	0	0	0	0	0	0	4	24	176	131	0	19	371
	6	Outer VA OR	16	0	0	0	0	-9	-20	-65	39	-153	16	-10	-66	-252
	7	WFC	0	0	0	0	0	-27	0	7	-12	-267	-45	-9	-60	-412
	8	Inner VA OR	99	49	12	12	0	-6	-54	-96	-30	-483	-86	30	55	-498
	9	VA BL/Yellow	28	9	0	0	0	-27	-75	-56	-241	-152	-15	7	-274	-796
	10	Core OR/BL/SL	35	7	12	46	10	3	-62	162	-15	-195	47	58	179	-37
	11	Other Core	0	0	8	50	0	0	-19	7	196	-166	-23	26	394	459
	12	East BL & OR	23	0	1	43	5	3	-20	53	-70	-525	-18	65	10	-429
	13	Non-Core	58	30	23	81	19	-60	-67	56	-128	-856	457	28	170	-198
Total			286	135	55	256	42	-128	-316	-36	-98	-1,521	802	187	560	227

Trips on the project = 3,067

Table A15: Adjusted Rail Trips by Access Mode – Other

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						27	31	151	124	619	188	12	183	1,334
7	WFC						10	49	90	81	422	74	16	92	833
8	Inner VA OR						72	60	135	109	905	160	9	216	1,665
9	VA BL/Yellow						96	52	500	3,176	5,009	1,924	96	1,065	11,917
10	Core OR/BL/SL	*No Trips in Before Conditions*					88	137	292	540	1,968	1,369	232	574	5,199
11	Other Core						251	52	396	1,623	6,094	7,453	0	3,412	19,281
12	East BL & OR						53	43	65	143	763	183	151	243	1,645
13	Non-Core						63	5	138	634	1,937	3,436	203	4,652	11,068
Total		0	0	0	0	0	660	428	1,767	6,429	17,716	14,786	719	10,438	52,943

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	0	24	11	6	36	10	79	52	493	78	37	30	906
2	Spring Hill	5	11	10	21	8	22	3	80	20	94	108	8	50	438
3	Greensboro	22	7	13	35	10	18	0	75	28	34	24	12	6	284
4	Tysons Corner	24	27	29	29	45	18	5	20	32	6	34	5	29	302
5	McLean	24	24	16	27	14	5	1	21	22	94	11	5	10	264
6	Outer VA OR	23	11	18	39	11	73	49	129	166	688	190	26	140	1,562
7	WFC	12	4	0	10	1	23	19	52	24	329	57	14	17	563
8	Inner VA OR	46	46	23	67	17	59	26	45	111	990	214	16	136	1,797
9	VA BL/Yellow	39	19	33	82	9	56	49	252	3,147	5,049	2,384	45	1,211	12,376
10	Core OR/BL/SL	119	0	17	85	49	123	52	413	1,015	2,586	1,752	280	599	7,088
11	Other Core	86	33	0	28	3	121	24	392	1,859	5,730	8,656	68	3,543	20,543
12	East BL & OR	0	3	40	19	14	47	35	41	144	822	200	69	318	1,753
13	Non-Core	60	69	12	65	0	85	26	193	1,066	2,670	5,097	83	5,683	15,109
Total		509	253	236	518	188	687	298	1,793	7,687	19,585	18,793	668	11,771	62,985

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	49	0	24	11	6	36	10	79	52	493	78	37	30	906
2	Spring Hill	5	11	10	21	8	22	3	80	20	94	108	8	50	438
3	Greensboro	22	7	13	35	10	18	0	75	28	34	24	12	6	284
4	Tysons Corner	24	27	29	29	45	18	5	20	32	6	34	5	29	302
5	McLean	24	24	16	27	14	5	1	21	22	94	0	5	10	264
6	Outer VA OR	23	11	18	39	11	46	18	-22	43	69	2	14	-43	228
7	WFC	12	4	0	10	1	14	-29	-38	-56	-93	-17	-2	-76	-270
8	Inner VA OR	46	46	23	67	17	-13	-34	-89	2	86	54	7	-80	132
9	VA BL/Yellow	39	19	33	82	9	-40	-3	-248	-29	40	461	-51	146	459
10	Core OR/BL/SL	119	0	17	85	49	35	-85	121	476	619	382	48	24	1,889
11	Other Core	86	33	0	28	3	-130	-28	-4	236	-363	1,104	68	130	1,262
12	East BL & OR	0	3	40	19	14	-7	-8	-24	1	59	17	-82	75	108
13	Non-Core	60	69	12	65	0	23	20	55	432	733	1,661	-120	1,013	4,041
Total		509	253	236	518	188	27	-131	26	1,258	1,869	4,006	-51	1,333	10,043

Trips on the project = 3,407

Table A16: Adjusted Rail Trips by Income – All Incomes

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						482	474	2,614	1,815	17,213	3,788	187	1,561	28,134
7	WFC						345	16	1,733	1,065	9,614	2,248	105	1,013	16,138
8	Inner VA OR						934	662	2,403	2,373	24,835	4,848	292	2,541	38,887
9	VA BL/Yellow						561	406	2,859	22,896	47,358	23,140	634	8,860	106,715
10	Core OR/BL/SL	*No Trips in Before Conditions*					1,700	1,064	5,589	9,694	40,461	12,327	2,938	11,193	84,966
11	Other Core						749	384	1,704	7,153	21,233	30,276	764	26,410	88,671
12	East BL & OR						286	390	1,325	3,501	26,555	6,655	4,080	7,893	50,685
13	Non-Core						1,011	924	4,247	15,685	67,801	113,494	3,548	78,078	284,686
Total		0	0	0	0	0	6,067	4,220	22,474	64,181	255,070	196,776	12,546	137,550	698,884

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	157	112	390	122	56	0	1,199	793	6,712	1,853	33	633	12,084
2	Spring Hill	31	0	0	54	12	16	0	62	48	658	50	28	58	1,017
3	Greensboro	7	0	0	24	8	0	0	60	41	502	72	0	36	751
4	Tysons Corner	155	58	0	0	31	4	0	298	173	1,021	230	6	220	2,197
5	McLean	51	6	8	44	0	4	0	121	108	1,165	238	0	64	1,809
6	Outer VA OR	93	9	11	73	37	353	110	1,992	1,453	16,088	3,626	109	1,306	25,259
7	WFC	5	1	0	5	0	105	0	301	160	3,478	680	19	246	4,999
8	Inner VA OR	674	194	352	906	277	862	72	2,291	1,804	25,926	4,422	126	2,581	40,485
9	VA BL/Yellow	186	101	40	208	75	239	82	1,769	20,868	44,045	25,111	601	8,643	101,948
10	Core OR/BL/SL	810	234	329	1,120	312	1,189	164	5,326	9,168	39,083	11,055	2,470	9,093	80,353
11	Other Core	337	35	90	269	82	382	87	1,598	8,087	19,430	30,908	720	23,191	85,215
12	East BL & OR	205	55	57	329	49	408	15	1,274	3,653	25,505	6,110	3,274	6,865	47,800
13	Non-Core	546	146	236	681	266	915	59	3,819	16,432	67,289	121,985	2,396	77,749	292,518
Total		3,124	997	1,234	4,103	1,271	4,533	569	20,109	62,789	250,901	206,340	9,779	130,685	696,435

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	157	112	390	122	56	0	1,199	793	6,712	1,853	33	633	12,084
2	Spring Hill	31	0	0	54	12	16	0	62	48	658	50	28	58	1,017
3	Greensboro	7	0	0	24	8	0	0	60	41	502	72	0	36	751
4	Tysons Corner	155	58	0	0	31	4	0	298	173	1,021	230	6	220	2,197
5	McLean	51	6	8	44	0	4	0	121	108	1,165	238	0	64	1,809
6	Outer VA OR	93	9	11	73	37	-129	-365	-622	-362	-1,125	-162	-78	-255	-2,875
7	WFC	5	1	0	5	0	-240	-16	-1,432	-905	-6,136	-1,568	-86	-767	-11,139
8	Inner VA OR	674	194	352	906	277	-72	-590	-113	-569	1,091	-426	-166	40	1,598
9	VA BL/Yellow	186	101	40	208	75	-323	-344	-1,099	-2,028	-3,313	1,971	-34	-217	-4,767
10	Core OR/BL/SL	810	234	329	1,120	312	-511	-900	-263	-525	-1,378	-1,272	-468	-2,101	-4,613
11	Other Core	337	35	90	269	82	-367	-296	-106	934	-1,803	632	-44	-3,219	-3,456
12	East BL & OR	205	55	57	329	49	123	-375	-52	152	-1,050	-546	-806	-1,028	-2,885
13	Non-Core	546	146	236	681	266	-96	-765	-429	747	-512	8,491	-1,350	-329	7,832
Total		3,124	997	1,234	4,103	1,271	-1,535	-3,651	-2,365	-1,392	-4,168	9,564	-2,766	-6,865	-2,449

Trips on the project = 27,293

Table A17: Adjusted Rail Trips by Income – <$50k

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						161	177	547	76	1,746	386	33	367	3,494
7	WFC						195	16	277	38	809	245	9	256	1,845
8	Inner VA OR						291	103	599	421	3,667	676	118	529	6,403
9	VA BL/Yellow						215	131	558	3,644	7,467	3,321	188	2,392	17,916
10	Core OR/BL/SL	*No Trips in Before Conditions*					364	195	1,347	1,898	8,087	2,391	1,115	3,451	18,846
11	Other Core						175	81	300	1,239	3,475	5,513	352	7,790	18,924
12	East BL & OR						90	203	389	991	5,710	2,031	2,969	4,152	16,535
13	Non-Core						397	263	1,289	4,124	11,842	23,367	2,281	30,147	73,705
Total		0	0	0	0	0	1,884	1,169	5,306	12,431	42,801	37,929	7,065	49,084	157,669

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	40	14	87	14	42	0	75	45	547	203	7	89	1,187
2	Spring Hill	0	0	0	0	0	7	0	13	9	49	11	28	24	141
3	Greensboro	0	0	0	0	0	0	0	0	0	68	0	0	0	68
4	Tysons Corner	61	19	0	0	0	2	0	17	82	154	23	6	116	479
5	McLean	7	0	8	27	0	4	0	81	5	115	6	0	0	253
6	Outer VA OR	58	0	0	36	10	155	48	233	145	1,318	300	19	210	2,531
7	WFC	0	0	0	0	0	45	0	41	11	291	7	6	93	494
8	Inner VA OR	127	35	55	140	7	246	38	417	317	3,376	387	46	384	5,574
9	VA BL/Yellow	49	42	0	52	13	100	23	316	3,377	6,017	2,629	356	1,830	14,803
10	Core OR/BL/SL	142	94	14	200	33	276	31	875	1,760	6,272	2,108	1,115	2,556	15,477
11	Other Core	20	11	9	64	0	34	51	344	1,271	2,486	4,493	256	6,207	15,245
12	East BL & OR	88	53	46	176	15	194	0	403	1,362	5,492	1,566	2,532	3,615	15,544
13	Non-Core	171	63	30	323	104	360	53	888	3,852	10,774	20,879	1,509	27,746	66,751
Total		746	358	175	1,106	196	1,464	243	3,702	12,236	36,959	32,613	5,879	42,869	138,546

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	24	40	14	87	14	42	0	75	45	547	203	7	89	1,187
2	Spring Hill	0	0	0	0	0	7	0	13	9	49	11	28	24	141
3	Greensboro	0	0	0	0	0	0	0	0	0	68	0	0	0	68
4	Tysons Corner	61	19	0	0	0	2	0	17	82	154	23	6	116	479
5	McLean	7	0	8	27	0	4	0	81	5	115	6	0	0	253
6	Outer VA OR	58	0	0	36	10	-7	-130	-314	69	-428	-86	-14	-157	-963
7	WFC	0	0	0	0	0	-150	-16	-237	-27	-517	-237	-3	-163	-1,351
8	Inner VA OR	127	35	55	140	7	-46	-65	-182	-104	-291	-289	-72	-145	-829
9	VA BL/Yellow	49	42	0	52	13	-114	-108	-242	-267	1,450	-692	167	-562	-1,113
10	Core OR/BL/SL	142	94	14	200	33	-88	-163	-472	-137	1,815	-283	0	-894	3,370
11	Other Core	20	11	9	64	0	-141	-30	44	32	-989	-1,020	-96	-2,584	-4,679
12	East BL & OR	88	53	46	176	15	104	-203	14	371	-217	-465	-437	-537	-991
13	Non-Core	171	63	30	323	104	-32	-211	-401	-272	-1,067	-2,488	772	-2,402	-6,554
Total		746	358	175	1,106	196	-420	-925	-1,605	-195	5,842	-5,316	1,186	-6,215	-19,123

Trips on the project = 4,409

Table A18: Adjusted Rail Trips by Income – $50k-$75k

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						86	88	429	281	1,941	423	35	206	3,489
7	WFC						17	0	170	62	998	296	14	177	1,734
8	Inner VA OR						239	164	455	375	3,993	594	27	469	6,315
9	VA BL/Yellow						65	55	503	2,806	7,797	3,877	105	1,474	16,684
10	Core OR/BL/SL	*No Trips in Before Conditions*					453	169	1,112	1,822	6,871	2,061	621	1,883	14,993
11	Other Core						192	100	434	1,310	3,345	5,831	172	4,942	16,326
12	East BL & OR						39	59	274	607	5,542	1,434	466	1,530	9,950
13	Non-Core						172	216	643	2,978	10,834	19,661	512	14,832	49,848
Total		0	0	0	0	0	1,262	851	4,022	10,241	41,322	34,177	1,953	25,513	119,340

Flag cells that exceed

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	9	0	80	9	8	0	181	154	531	72	0	71	1,115
2	Spring Hill	0	0	0	8	0	3	0	0	11	44	0	0	12	78
3	Greensboro	0	0	0	24	0	0	0	38	0	80	5	0	4	151
4	Tysons Corner	80	0	0	0	0	0	0	122	45	229	43	0	13	532
5	McLean	0	0	0	17	0	0	0	0	55	81	0	0	41	194
6	Outer VA OR	0	0	0	2	0	57	0	194	113	1,869	518	11	133	2,898
7	WFC	0	1	0	5	0	12	0	51	0	459	103	0	22	652
8	Inner VA OR	147	13	65	159	19	153	18	409	301	3,192	794	20	432	5,723
9	VA BL/Yellow	81	0	0	71	19	25	21	278	2,462	6,139	3,234	94	1,386	13,810
10	Core OR/BL/SL	133	67	119	145	19	275	28	1,027	1,347	6,553	1,501	346	1,592	13,153
11	Other Core	113	0	25	23	19	88	7	249	1,304	3,160	4,763	153	4,144	14,048
12	East BL & OR	50	0	0	51	10	42	15	309	748	4,978	1,137	451	1,360	9,153
13	Non-Core	85	20	98	156	65	160	0	806	2,823	9,893	19,333	402	13,963	47,806
Total		689	109	307	741	161	823	90	3,666	9,365	37,209	31,502	1,478	23,173	109,311

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	9	0	80	9	8	0	181	154	531	72	0	71	1,115
2	Spring Hill	0	0	0	8	0	3	0	0	11	44	0	0	12	78
3	Greensboro	0	0	0	24	0	0	0	38	0	80	5	0	4	151
4	Tysons Corner	80	0	0	0	0	0	0	122	45	229	43	0	13	532
5	McLean	0	0	0	17	0	0	0	0	55	81	0	0	41	194
6	Outer VA OR	0	0	0	2	0	-29	-88	-234	-168	-72	95	-24	-73	-591
7	WFC	0	1	0	5	0	-6	0	-119	-62	-539	-192	-14	-155	-1,082
8	Inner VA OR	147	13	65	159	19	-86	-146	-46	-73	-801	200	-7	-37	-592
9	VA BL/Yellow	81	0	0	71	19	-41	-34	-221	-344	-1,658	-644	-11	-88	-2,875
10	Core OR/BL/SL	133	67	119	145	19	-177	-141	-85	-475	-318	-561	-275	-292	-1,841
11	Other Core	113	0	25	23	19	-104	-93	-185	-6	-185	-1,067	-20	-797	-2,278
12	East BL & OR	50	0	0	51	10	4	-44	35	141	-564	-297	-15	-170	-798
13	Non-Core	85	20	98	156	65	-12	-216	162	-155	-941	-328	-109	-868	-2,042
Total		689	109	307	741	161	-440	-762	-356	-876	-4,113	-2,674	-475	2,340	-10,029

Trips on the project = 3,850

Table A19: Adjusted Rail Trips by Income – $75k-$100k

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR						123	28	463	276	2,482	575	53	186	4,185
	7 WFC						63	0	284	197	1,476	236	22	208	2,486
	8 Inner VA OR						67	108	401	293	3,224	647	61	438	5,240
	9 VA BL/Yellow						69	118	489	4,020	7,711	3,797	91	1,443	17,728
	10 Core OR/BL/SL	*No Trips in Before Conditions*					159	190	828	1,786	5,606	1,736	339	1,716	12,360
	11 Other Core						144	47	259	1,019	3,774	4,675	82	3,907	13,907
	12 East BL & OR						97	49	235	568	4,768	1,015	255	722	7,711
	13 Non-Core						209	103	588	2,428	10,412	17,029	271	10,837	41,877
Total		0	0	0	0	0	930	642	3,548	10,587	39,453	29,701	1,176	19,457	105,494

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	0	58	15	0	0	212	92	875	134	0	165	1,552
	2 Spring Hill	0	0	0	0	0	0	0	8	11	143	11	0	10	183
	3 Greensboro	0	0	0	0	0	0	0	0	12	61	5	0	0	77
	4 Tysons Corner	14	0	0	0	16	0	0	66	5	103	29	0	35	268
	5 McLean	11	0	0	0	0	0	0	26	0	151	52	0	4	243
	6 Outer VA OR	4	7	11	32	0	53	24	353	96	2,187	349	33	179	3,325
	7 WFC	0	0	0	0	0	21	0	27	36	310	93	0	30	517
	8 Inner VA OR	139	47	43	196	77	126	16	429	252	3,497	606	14	370	5,812
	9 VA BL/Yellow	24	25	0	10	12	21	0	259	3,299	6,817	4,158	66	1,523	16,212
	10 Core OR/BL/SL	131	0	44	212	76	226	9	806	1,729	5,700	1,518	420	1,353	12,226
	11 Other Core	41	24	5	14	25	66	0	214	1,281	3,250	5,208	116	3,522	13,765
	12 East BL & OR	18	0	0	21	13	85	0	196	399	4,503	1,029	192	704	7,159
	13 Non-Core	59	52	39	42	50	101	7	598	2,566	10,362	18,986	182	10,387	43,431
Total		441	154	142	584	284	700	55	3,194	9,777	37,959	32,178	1,021	18,282	104,772

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	0	58	15	0	0	212	92	875	134	0	165	1,552
	2 Spring Hill	0	0	0	0	0	0	0	8	11	143	11	0	10	183
	3 Greensboro	0	0	0	0	0	0	0	0	12	61	5	0	0	77
	4 Tysons Corner	14	0	0	0	16	0	0	66	5	103	29	0	35	268
	5 McLean	11	0	0	0	0	0	0	26	0	151	52	0	4	243
	6 Outer VA OR	4	7	11	32	0	-70	-4	-110	-180	-295	-225	-22	-8	-860
	7 WFC	0	0	0	0	0	-42	0	-257	-161	-1,166	-144	-22	-178	1,969
	8 Inner VA OR	139	47	43	196	77	59	-92	28	-41	273	-41	-47	-68	572
	9 VA BL/Yellow	24	25	0	10	12	-48	-118	-230	-722	-894	370	-25	80	-1,515
	10 Core OR/BL/SL	131	0	44	212	76	67	-181	-22	-57	94	-218	81	-362	-133
	11 Other Core	41	24	5	14	25	-77	-47	-45	262	-524	533	34	-385	142
	12 East BL & OR	18	0	0	21	13	-12	-49	-39	-170	-265	13	-64	-18	-552
	13 Non-Core	59	52	39	42	50	-107	-96	10	138	-49	1,957	-90	-450	1,554
Total		441	154	142	584	284	-230	-587	-354	-810	-1,494	2,477	-155	-1,175	-722

Trips on the project = 3,816

Table A20: Adjusted Rail Trips by Income – >$100k

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR	*No Trips in Before Conditions*					112	182	1,175	1,182	11,044	2,405	65	802	16,966
7	WFC						70	0	1,002	767	6,331	1,471	60	373	10,073
8	Inner VA OR						337	287	947	1,284	13,951	2,932	86	1,105	20,929
9	VA BL/Yellow						213	102	1,308	12,425	24,383	12,155	250	3,551	54,388
10	Core OR/BL/SL						724	510	2,301	4,188	19,897	6,139	863	4,143	38,767
11	Other Core						238	156	711	3,585	10,638	14,257	157	9,771	39,514
12	East BL & OR						60	79	427	1,334	10,535	2,175	389	1,489	16,488
13	Non-Core						238	242	1,726	6,155	34,713	53,437	482	22,262	119,256
	Total	0	0	0	0	0	1,991	1,558	9,598	30,922	131,494	94,969	2,352	43,497	316,381

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	108	98	165	84	5	0	731	502	4,759	1,444	25	309	8,231
2	Spring Hill	31	0	0	45	12	7	0	41	16	423	27	0	12	615
3	Greensboro	7	0	0	0	8	0	0	23	30	293	62	0	32	455
4	Tysons Corner	0	40	0	0	16	2	0	92	42	535	136	0	56	918
5	McLean	33	6	0	0	0	0	0	15	48	817	180	0	19	1,119
6	Outer VA OR	31	3	0	2	27	88	38	1,212	1,099	10,734	2,458	47	785	16,505
7	WFC	5	0	0	0	0	28	0	183	112	2,417	477	13	102	3,336
8	Inner VA OR	261	99	188	411	174	337	0	1,034	933	15,861	2,636	46	1,395	23,376
9	VA BL/Yellow	32	34	40	75	31	93	18	917	11,730	25,073	15,091	85	3,904	57,123
10	Core OR/BL/SL	405	74	151	563	183	413	95	2,617	4,332	20,558	5,928	588	3,591	39,498
11	Other Core	163	0	52	168	39	193	29	791	4,231	10,534	16,443	195	9,318	42,157
12	East BL & OR	48	2	11	82	10	87	0	366	1,144	10,532	2,377	98	1,186	15,944
13	Non-Core	232	10	69	160	46	293	0	1,527	7,192	36,259	62,786	303	25,652	134,530
	Total	1,248	375	610	1,672	630	1,546	181	9,548	31,411	138,775	110,047	1,402	46,362	343,806

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	108	98	165	84	5	0	731	502	4,759	1,444	25	309	8,231
2	Spring Hill	31	0	0	45	12	7	0	41	16	423	27	0	12	615
3	Greensboro	7	0	0	0	8	0	0	23	30	293	62	0	32	455
4	Tysons Corner	0	40	0	0	16	2	0	92	42	535	136	0	56	918
5	McLean	33	6	0	0	0	0	0	15	48	817	180	0	19	1,119
6	Outer VA OR	31	3	0	2	27	-23	-143	37	-83	-330	54	-18	-17	-461
7	WFC	5	0	0	0	0	-42	0	-819	-655	-5,914	-994	-47	-271	-6,738
8	Inner VA OR	261	99	188	411	174	0	-287	87	-351	1,910	-296	-40	290	2,447
9	VA BL/Yellow	32	34	40	75	31	-120	-84	-392	-696	690	2,936	-165	353	2,735
10	Core OR/BL/SL	405	74	151	563	183	-312	-415	315	144	661	-211	-275	-552	731
11	Other Core	163	0	52	168	39	-45	-127	80	645	-105	2,187	38	-453	2,642
12	East BL & OR	48	2	11	82	10	27	-79	-62	-190	-3	203	-291	-303	-545
13	Non-Core	232	10	69	160	46	55	-242	-200	1,037	1,546	9,350	-179	3,391	15,274
	Total	1,248	375	610	1,672	630	-446	-1,377	-50	489	7,281	12,878	-951	2,865	27,425

Trips on the project = 15,219

Table A21: Adjusted Rail Trips by Vehicles Owned – All Levels of Ownership

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					482	474	2,785	1,975	18,683	4,097	197	1,670	30,364
	7 WFC						346	16	1,827	1,152	10,272	2,444	116	994	17,167
	8 Inner VA OR						987	694	2,502	2,502	26,250	5,237	265	2,674	41,111
	9 VA BL/Yellow						613	406	3,006	23,950	50,093	24,160	655	9,288	112,171
	10 Core OR/BL/SL						1,796	1,111	5,742	10,142	42,171	12,849	2,835	11,626	88,273
	11 Other Core						778	420	1,746	7,582	22,202	31,297	822	27,237	92,084
	12 East BL & OR						341	396	1,378	3,664	27,494	7,047	4,238	8,068	52,627
	13 Non-Core						1,056	883	4,457	16,456	71,765	119,005	3,610	81,232	298,465
Total		0	0	0	0	0	6,400	4,402	23,444	67,423	268,930	206,135	12,739	142,790	732,261

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	202	112	417	122	56	0	1,355	853	7,741	2,310	51	742	13,984
	2 Spring Hill	60	0	0	54	12	13	0	62	65	716	74	28	58	1,141
	3 Greensboro	7	0	0	24	8	0	0	66	53	616	98	0	36	908
	4 Tysons Corner	177	58	0	0	31	4	0	317	173	1,137	236	6	220	2,361
	5 McLean	60	6	8	44	0	4	0	129	114	1,358	278	0	64	2,065
	6 Outer VA OR	93	9	11	88	37	366	127	2,309	1,677	17,756	4,121	109	1,461	28,163
	7 WFC	5	1	0	5	0	109	0	334	183	3,822	772	19	277	5,527
	8 Inner VA OR	768	216	410	1,054	300	883	80	2,441	2,005	29,006	5,104	122	2,825	45,215
	9 VA BL/Yellow	186	101	78	227	75	291	62	1,920	23,271	48,850	28,151	604	9,516	113,330
	10 Core OR/BL/SL	903	281	350	1,128	336	1,266	171	5,870	10,134	42,781	12,191	2,611	9,745	87,766
	11 Other Core	337	35	112	283	82	390	87	1,773	8,857	21,527	33,946	782	25,321	93,531
	12 East BL & OR	205	55	58	329	49	423	15	1,370	3,845	27,606	6,594	3,413	7,093	51,056
	13 Non-Core	610	158	255	758	273	965	59	4,056	17,743	73,224	132,531	2,485	82,611	315,727
Total		3,435	1,122	1,393	4,411	1,326	4,771	601	22,002	68,972	276,140	226,405	10,228	139,967	760,772

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	202	112	417	122	56	0	1,355	853	7,741	2,310	51	742	13,984
	2 Spring Hill	60	0	0	54	12	13	0	62	65	716	74	28	58	1,141
	3 Greensboro	7	0	0	24	8	0	0	66	53	616	98	0	36	908
	4 Tysons Corner	177	58	0	0	31	4	0	317	173	1,137	236	6	220	2,361
	5 McLean	60	6	8	44	0	4	0	129	114	1,358	278	0	64	2,065
	6 Outer VA OR	93	9	11	88	37	-116	-348	-477	-298	-928	24	-88	-210	-2,201
	7 WFC	5	1	0	5	0	-237	-16	-1,993	-969	-4,450	-1,673	-97	-717	-11,841
	8 Inner VA OR	768	216	410	1,054	300	-104	-614	-62	-496	2,757	-133	-143	151	4,104
	9 VA BL/Yellow	186	101	78	227	75	-322	-344	-1,986	-680	-1,243	3,991	-51	228	1,159
	10 Core OR/BL/SL	903	281	350	1,128	336	-531	-940	128	-8	610	-658	-224	-1,087	-507
	11 Other Core	337	35	112	283	82	-388	-333	27	1,275	-675	2,650	-40	-1,917	1,447
	12 East BL & OR	205	55	58	329	49	82	381	-8	180	113	-453	-825	-975	-1,571
	13 Non-Core	610	158	255	758	273	-92	-824	-400	1,287	1,459	13,326	-1,125	1,378	17,262
Total		3,435	1,122	1,393	4,411	1,326	-1,629	-1,801	-1,441	1,550	7,210	20,270	-2,511	-2,823	28,511

Trips on the project = 30,719

Table A22: Adjusted Rail Trips by Vehicles Owned – 0 Vehicles – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					119	151	231	121	634	142	34	184	1,617
	7 WFC						130	0	92	29	349	83	18	52	754
	8 Inner VA OR						377	327	606	583	3,513	630	58	541	6,635
	9 VA BL/Yellow						211	131	681	3,044	6,489	3,042	142	1,514	15,253
	10 Core OR/BL/SL						462	481	2,160	2,892	11,207	3,341	887	3,771	25,201
	11 Other Core						251	164	605	2,199	6,264	9,249	305	11,443	30,479
	12 East BL & OR						112	154	205	764	3,337	1,216	2,373	2,845	11,005
	13 Non-Core						346	389	1,142	4,133	11,894	22,591	1,736	29,182	71,412
Total		0	0	0	0	0	2,008	1,797	5,723	13,766	43,686	40,294	5,553	49,530	162,357

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	36	14	98	11	8	0	78	53	242	25	7	78	650
	2 Spring Hill	14	0	0	0	0	0	0	8	9	117	0	28	36	212
	3 Greensboro	0	0	0	13	0	0	0	0	0	99	0	0	13	125
	4 Tysons Corner	78	58	0	0	16	0	0	83	86	113	7	6	133	581
	5 McLean	5	0	3	17	0	0	0	56	12	68	6	0	18	186
	6 Outer VA OR	77	0	0	36	10	173	48	203	116	779	177	19	160	1,797
	7 WFC	0	1	0	5	0	12	0	31	6	191	16	0	47	307
	8 Inner VA OR	254	47	158	544	92	274	40	928	666	4,986	681	35	565	9,271
	9 VA BL/Yellow	74	17	0	74	62	48	0	387	3,688	6,841	3,480	226	2,050	16,945
	10 Core OR/BL/SL	234	62	157	545	184	499	43	2,592	3,122	13,641	2,889	1,018	3,039	28,025
	11 Other Core	83	11	64	122	47	138	51	673	2,951	6,298	10,571	257	10,686	31,952
	12 East BL & OR	51	53	6	66	18	162	0	315	917	3,431	969	1,867	2,622	10,478
	13 Non-Core	205	86	90	410	182	365	7	1,267	5,526	13,242	27,100	1,278	29,271	79,029
Total		1,076	371	492	1,929	622	1,680	188	6,622	17,153	50,046	45,919	4,742	48,718	179,557

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	36	14	98	11	8	0	78	53	242	25	7	78	650
	2 Spring Hill	14	0	0	0	0	0	0	8	9	117	0	28	36	212
	3 Greensboro	0	0	0	13	0	0	0	0	0	99	0	0	13	125
	4 Tysons Corner	78	58	0	0	16	0	0	83	86	113	7	6	133	581
	5 McLean	5	0	3	17	0	0	0	56	12	68	6	0	18	186
	6 Outer VA OR	77	0	0	36	10	54	-103	-29	5	144	34	-15	-24	180
	7 WFC	0	1	0	5	0	-119	0	-61	-23	-158	-68	-18	-5	-447
	8 Inner VA OR	254	47	158	544	92	-103	-287	322	83	1,473	51	-22	24	2,688
	9 VA BL/Yellow	74	17	0	74	62	-163	-131	-795	643	352	438	84	536	1,692
	10 Core OR/BL/SL	234	62	157	545	184	37	-438	433	230	1,434	-453	131	-731	2,824
	11 Other Core	83	11	64	122	47	-113	-113	68	751	34	3,122	48	-256	1,473
	12 East BL & OR	51	53	6	66	18	50	-154	110	153	94	-247	-506	-222	-528
	13 Non-Core	205	86	90	410	182	20	-383	125	1,393	1,346	4,509	-458	89	7,617
Total		1,076	371	492	1,929	622	-328	-1,609	899	3,389	5,959	8,624	-810	-812	17,201

Trips on the project = 5,881

Table A23: Adjusted Rail Trips by Vehicles Owned – 1 Vehicle – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					180	127	839	606	5,833	1,094	45	516	9,239
	7 WFC						92	0	666	370	2,918	823	52	468	5,389
	8 Inner VA OR						369	262	1,121	1,159	12,791	2,313	127	1,371	19,513
	9 VA BL/Yellow						266	718	1,234	8,837	23,063	10,957	234	4,316	49,126
	10 Core OR/BL/SL						579	356	2,281	4,000	19,053	5,221	887	4,364	36,740
	11 Other Core						188	181	644	2,845	8,334	12,222	216	9,677	34,308
	12 East BL & OR						94	110	458	1,067	9,333	2,109	1,079	2,465	16,716
	13 Non-Core						367	283	1,797	5,788	27,695	48,008	1,078	30,559	115,575
	Total	0	0	0	0	0	2,136	1,538	9,041	24,673	109,020	82,748	3,717	53,735	286,607

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	32	68	123	57	13	0	446	203	1,903	517	18	202	3,583
	2 Spring Hill	0	0	0	20	6	7	0	39	28	190	58	0	12	359
	3 Greensboro	7	0	0	11	8	0	0	50	0	141	55	0	6	279
	4 Tysons Corner	99	0	0	0	8	2	0	151	40	477	103	0	43	923
	5 McLean	25	6	0	27	0	4	0	50	23	424	89	0	7	655
	6 Outer VA OR	16	0	11	18	27	131	25	760	454	5,470	1,425	11	599	8,948
	7 WFC	5	0	0	0	0	45	0	131	71	1,226	224	6	114	1,822
	8 Inner VA OR	359	63	167	335	153	374	16	995	860	13,845	2,315	35	1,299	20,817
	9 VA BL/Yellow	52	66	38	89	6	154	21	931	8,508	22,952	13,067	197	3,985	50,066
	10 Core OR/BL/SL	275	112	151	349	75	244	53	2,088	3,645	18,282	5,025	759	3,404	34,462
	11 Other Core	137	24	30	69	12	116	7	633	3,066	7,983	12,908	266	8,961	34,212
	12 East BL & OR	78	0	41	165	16	125	15	355	1,187	9,247	2,134	925	2,298	16,585
	13 Non-Core	353	32	93	265	83	362	33	1,567	6,018	28,190	52,959	547	30,752	121,253
	Total	1,407	335	599	1,470	452	1,578	171	8,196	24,104	110,329	90,877	2,765	51,682	293,964

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	32	68	123	57	13	0	446	203	1,903	517	18	202	3,583
	2 Spring Hill	0	0	0	20	6	7	0	39	28	190	58	0	12	359
	3 Greensboro	7	0	0	11	8	0	0	50	0	141	55	0	6	279
	4 Tysons Corner	99	0	0	0	8	2	0	151	40	477	103	0	43	923
	5 McLean	25	6	0	27	0	4	0	50	23	424	89	0	7	655
	6 Outer VA OR	16	0	11	18	27	-49	-102	-78	-152	-363	331	-33	83	-291
	7 WFC	5	0	0	0	0	-47	0	-535	-299	-1,049	-599	-46	-355	-3,567
	8 Inner VA OR	359	63	167	335	153	6	-246	-126	-299	1,054	2	-92	-71	1,303
	9 VA BL/Yellow	52	66	38	89	6	-113	-197	-303	-329	-111	2,109	-37	331	939
	10 Core OR/BL/SL	275	112	151	349	75	-334	-302	-193	-355	-771	-197	-127	-960	-2,278
	11 Other Core	137	24	30	69	12	-72	-174	-11	221	-351	686	50	-716	-95
	12 East BL & OR	78	0	41	165	16	30	-95	-103	119	-86	25	-154	-167	-131
	13 Non-Core	353	32	93	265	83	-5	-251	-230	230	495	4,951	-531	193	5,678
	Total	1,407	335	599	1,470	452	-559	-1,367	-844	-569	1,308	8,129	-952	-2,053	7,356

Trips on the project = 9,563

Table A24: Adjusted Rail Trips by Vehicles Owned – 2+ Vehicles – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					183	196	1,715	1,248	12,216	2,860	118	971	19,508
	7 WFC						124	16	1,069	753	7,004	1,538	46	474	11,024
	8 Inner VA OR						241	105	775	759	9,946	2,293	80	762	14,962
	9 VA BL/Yellow						136	57	1,091	12,069	20,542	10,160	278	3,458	47,791
	10 Core OR/BL/SL						755	275	1,301	3,250	11,911	4,286	1,061	3,492	26,333
	11 Other Core						338	75	497	2,537	7,605	9,826	301	4,118	27,297
	12 East BL & OR						135	133	714	1,833	14,824	3,722	786	2,759	24,905
	13 Non-Core						343	211	1,518	6,535	32,176	48,406	797	21,491	111,478
Total		0	0	0	0	0	2,256	1,067	8,680	28,984	116,223	83,093	3,469	39,526	283,297

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	133	29	196	54	35	0	831	597	5,595	1,769	25	463	9,751
	2 Spring Hill	46	0	0	34	6	7	0	16	28	409	16	0	10	570
	3 Greensboro	0	0	0	0	0	0	0	16	53	376	42	0	17	504
	4 Tysons Corner	0	0	0	0	8	2	0	83	47	547	126	0	43	857
	5 McLean	29	0	4	0	0	0	0	24	79	867	183	0	38	1,224
	6 Outer VA OR	0	9	0	34	0	62	53	1,345	1,107	11,507	2,519	78	702	17,418
	7 WFC	0	0	0	0	0	52	0	172	106	2,405	532	13	117	3,397
	8 Inner VA OR	155	106	85	175	56	234	24	517	479	10,176	2,108	52	961	15,128
	9 VA BL/Yellow	60	18	40	64	6	89	41	603	11,075	19,057	11,605	180	3,481	46,319
	10 Core OR/BL/SL	393	107	43	234	77	522	75	1,190	3,367	10,859	4,278	833	3,301	25,279
	11 Other Core	116	0	18	92	22	135	29	467	2,840	7,247	10,467	258	5,674	27,367
	12 East BL & OR	75	2	11	99	16	137	0	699	1,740	14,928	3,491	621	2,173	23,993
	13 Non-Core	52	40	72	84	7	237	20	1,222	6,198	31,792	52,472	660	22,588	115,444
Total		951	416	303	1,011	252	1,513	242	7,184	27,716	115,766	89,609	2,721	39,567	287,251

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	133	29	196	54	35	0	831	597	5,595	1,769	25	463	9,751
	2 Spring Hill	46	0	0	34	6	7	0	16	28	409	16	0	10	570
	3 Greensboro	0	0	0	0	0	0	0	16	53	376	42	0	17	504
	4 Tysons Corner	0	0	0	0	8	2	0	83	47	547	126	0	43	857
	5 McLean	29	0	4	0	0	0	0	24	79	867	183	0	38	1,224
	6 Outer VA OR	0	9	0	34	0	-121	-143	-370	-141	-709	-341	-40	-269	-2,090
	7 WFC	0	0	0	0	0	-72	-16	-897	-647	-4,599	-1,006	-33	-357	-7,627
	8 Inner VA OR	155	106	85	175	56	-7	-81	-257	-280	230	-185	-28	198	166
	9 VA BL/Yellow	60	18	40	64	6	-47	-16	-488	-994	-1,485	1,445	-98	23	-1,472
	10 Core OR/BL/SL	393	107	43	234	77	-233	-200	-112	117	-1,052	-8	-228	-191	-1,054
	11 Other Core	116	0	18	92	22	-201	-46	-30	303	-358	642	-43	-445	70
	12 East BL & OR	75	2	11	99	16	2	-133	-14	-92	105	-231	-165	-586	-913
	13 Non-Core	52	40	72	84	7	-106	-191	-296	-337	-384	4,066	-137	1,097	3,967
Total		951	416	303	1,011	252	-743	-825	-1,496	-1,268	-458	6,516	-748	41	3,954

Trips on the project = 15,275

Table A25: Adjusted Rail Trips by Time Period – All Day – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					482	474	2,898	2,027	19,271	4,279	212	1,723	31,366
	7 WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
	8 Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
	9 VA BL/Yellow						625	406	3,058	24,911	51,306	24,754	780	9,680	115,519
	10 Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
	11 Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
	12 East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
	13 Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total		0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
	2 Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
	3 Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
	4 Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
	5 McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
	6 Outer VA OR	101	20	18	112	48	366	145	2,309	1,707	17,871	4,145	128	1,481	28,451
	7 WFC	18	5	0	14	1	109	19	352	189	1,831	780	33	286	5,638
	8 Inner VA OR	768	247	410	1,054	300	883	98	2,441	2,005	29,138	5,128	132	2,837	45,441
	9 VA BL/Yellow	186	110	93	227	78	296	97	1,936	23,369	49,148	28,278	616	9,553	113,987
	10 Core OR/BL/SL	903	281	350	1,128	336	1,266	223	5,909	10,162	42,932	12,208	2,708	9,827	88,232
	11 Other Core	337	68	112	283	85	398	96	1,773	8,912	21,671	34,045	798	25,443	94,021
	12 East BL & OR	205	56	70	334	59	423	50	1,380	3,865	27,912	6,680	3,430	7,151	51,613
	13 Non-Core	623	227	255	758	273	965	85	4,073	17,862	73,704	133,187	2,497	83,039	317,547
Total		3,546	1,349	1,520	4,549	1,431	4,869	831	22,240	69,388	277,822	227,608	10,465	140,790	766,407

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	49	202	136	417	122	75	10	1,355	853	7,783	2,322	60	742	14,126
	2 Spring Hill	64	11	10	74	20	38	3	129	76	716	170	36	96	1,442
	3 Greensboro	29	8	13	49	18	18	0	121	69	621	117	12	42	1,117
	4 Tysons Corner	202	85	29	29	76	22	5	317	188	1,137	270	10	220	2,591
	5 McLean	62	30	23	71	14	10	1	146	130	1,358	278	5	74	2,202
	6 Outer VA OR	101	20	18	112	48	-116	-329	-589	-320	-1,400	-134	-84	-242	-2,915
	7 WFC	18	5	0	14	1	-253	-45	-1,515	-972	-6,713	-1,765	-88	-777	-12,110
	8 Inner VA OR	768	247	410	1,054	300	-116	-619	-134	-582	2,396	-167	-199	71	3,429
	9 VA BL/Yellow	186	110	93	227	78	-328	-309	-1,127	-1,542	-2,158	3,524	-164	-127	-1,532
	10 Core OR/BL/SL	903	281	350	1,128	336	-636	-987	-25	-359	-368	-966	-726	-2,467	-3,537
	11 Other Core	337	68	112	283	85	-419	-330	-33	1,139	-1,056	2,072	-53	-2,808	-606
	12 East BL & OR	205	56	70	334	59	59	-381	-79	33	-1,036	-764	-998	1,351	-3,794
	13 Non-Core	623	227	255	758	273	-121	-832	-517	1,017	154	11,248	-1,351	-493	11,240
Total		3,546	1,349	1,520	4,549	1,431	-1,767	-3,814	-1,946	-275	1,414	16,205	-3,540	-7,020	11,651

Trips on the project = 32,029

Table A26: Adjusted Rail Trips by Time Period – AM Peak – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					143	193	1,113	897	8,135	1,632	101	679	12,893
	7 WFC						96	15	716	458	4,440	1,017	43	327	7,112
	8 Inner VA OR						289	279	624	818	9,525	1,751	88	860	14,233
	9 VA BL/Yellow						188	143	1,005	7,968	18,807	8,284	188	3,021	39,605
	10 Core OR/BL/SL						339	342	1,493	2,490	11,783	2,894	695	2,509	22,545
	11 Other Core						97	80	423	1,994	6,417	7,946	155	6,019	23,130
	12 East BL & OR						139	193	647	1,555	12,249	2,814	1,158	2,866	21,622
	13 Non-Core						374	410	1,760	6,155	29,338	41,739	1,209	24,990	105,974
Total		0	0	0	0	0	1,666	1,655	7,781	22,336	100,694	68,076	3,637	41,270	247,115

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	11	103	51	121	45	0	0	543	328	3,172	841	18	253	5,487
	2 Spring Hill	0	4	1	8	7	14	0	62	23	260	62	0	48	489
	3 Greensboro	0	3	5	8	3	11	0	35	23	215	27	0	8	339
	4 Tysons Corner	67	24	3	3	23	18	0	88	27	342	59	6	52	710
	5 McLean	31	10	7	18	6	0	1	29	41	572	103	0	57	873
	6 Outer VA OR	60	3	0	0	22	105	52	884	715	7,513	1,487	48	549	11,437
	7 WFC	9	1	0	5	0	27	5	121	98	1,569	304	0	98	2,236
	8 Inner VA OR	320	67	164	328	146	245	16	584	614	10,830	1,751	57	1,013	16,134
	9 VA BL/Yellow	47	40	38	67	38	76	6	647	7,650	18,160	10,000	181	3,331	40,281
	10 Core OR/BL/SL	328	102	143	301	124	399	30	2,049	2,976	12,482	3,008	886	2,939	25,769
	11 Other Core	60	11	41	67	18	94	16	545	2,603	6,628	9,119	259	7,294	26,755
	12 East BL & OR	91	38	31	96	28	192	31	575	1,523	11,685	2,532	932	2,530	20,284
	13 Non-Core	270	78	112	240	92	360	20	1,596	6,536	29,524	46,141	816	26,719	112,502
Total		1,294	484	595	1,263	553	1,541	176	7,757	23,158	102,951	75,432	3,202	44,890	263,295

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	11	103	51	121	45	0	0	543	328	3,172	841	18	253	5,487
	2 Spring Hill	0	4	1	8	7	14	0	62	23	260	62	0	48	489
	3 Greensboro	0	3	5	8	3	11	0	35	23	215	27	0	8	339
	4 Tysons Corner	67	24	3	3	23	18	0	88	27	342	59	6	52	710
	5 McLean	31	10	7	18	6	0	1	29	41	572	103	0	57	873
	6 Outer VA OR	60	3	0	0	22	-38	-141	-229	-182	-622	-145	-53	-129	-1,456
	7 WFC	9	1	0	5	0	-69	-10	-595	-360	-1,871	-713	-43	-230	-4,876
	8 Inner VA OR	320	67	164	328	146	-44	-263	-40	-204	1,308	0	-31	153	1,981
	9 VA BL/Yellow	47	40	38	67	38	-112	-137	-358	-319	-647	1,716	-7	309	676
	10 Core OR/BL/SL	328	102	143	301	124	60	-312	556	486	699	114	191	430	3,224
	11 Other Core	60	11	41	67	18	-5	-64	122	611	211	1,177	104	1,275	3,625
	12 East BL & OR	91	38	31	96	28	53	-162	-72	-32	-564	-283	-226	-336	-1,338
	13 Non-Core	270	78	112	240	92	-14	-390	-164	382	186	4,403	-394	1,729	6,528
Total		1,294	484	595	1,263	553	-125	1,479	-24	822	2,257	7,356	-435	3,620	16,181

Trips on the project = 11,524

Table A27: Adjusted Rail Trips by Time Period – Mid-Day – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					95	86	310	233	2,180	373	29	319	3,625
	7 WFC						80	16	212	160	1,187	246	26	295	2,221
	8 Inner VA OR						205	78	525	482	3,813	719	82	440	6,344
	9 VA BL/Yellow						125	68	510	5,416	8,212	3,550	129	1,734	19,744
	10 Core OR/BL/SL						430	181	1,159	2,858	12,007	3,892	723	3,215	24,465
	11 Other Core						173	93	161	1,499	5,179	7,191	182	5,959	20,436
	12 East BL & OR						41	59	166	604	3,846	1,179	1,293	1,810	8,998
	13 Non-Core						140	43	619	3,112	11,266	19,991	902	17,907	53,980
Total		0	0	0	0	0	1,289	624	3,663	14,363	47,690	37,139	3,365	31,679	139,813

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	7	17	21	65	17	36	4	142	122	949	307	12	139	1,839
	2 Spring Hill	17	3	3	19	6	7	1	0	9	110	20	6	10	211
	3 Greensboro	7	1	5	19	5	5	0	41	12	65	20	9	8	199
	4 Tysons Corner	49	19	0	4	17	2	4	93	46	158	35	0	65	491
	5 McLean	0	2	3	9	1	4	0	24	23	183	41	0	0	291
	6 Outer VA OR	4	4	1	36	5	76	29	242	242	2,073	609	22	245	3,590
	7 WFC	2	1	0	2	0	29	4	32	0	402	64	18	49	603
	8 Inner VA OR	68	60	22	131	24	197	32	489	442	3,898	666	16	382	6,426
	9 VA BL/Yellow	96	30	16	58	12	63	49	321	5,161	7,963	4,025	161	1,860	19,812
	10 Core OR/BL/SL	213	72	95	294	58	286	74	1,221	2,992	11,372	3,508	734	2,698	23,616
	11 Other Core	139	24	28	85	20	92	50	300	2,039	4,704	7,590	207	5,879	21,156
	12 East BL & OR	27	6	6	80	7	56	0	189	595	3,376	1,040	884	1,267	7,532
	13 Non-Core	83	48	28	134	10	176	13	562	2,841	10,550	20,682	714	16,289	52,150
Total		711	287	228	936	203	1,029	260	3,656	14,524	45,802	38,607	2,783	28,891	137,916

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	7	17	21	65	17	36	4	142	122	949	307	12	139	1,839
	2 Spring Hill	17	3	3	19	6	7	1	0	9	110	20	6	10	211
	3 Greensboro	7	1	5	19	5	5	0	41	12	65	20	9	8	199
	4 Tysons Corner	49	19	0	4	17	2	4	93	46	158	35	0	65	491
	5 McLean	0	2	3	9	1	4	0	24	23	183	41	0	0	291
	6 Outer VA OR	4	4	1	36	5	-19	-57	-69	9	-107	237	-7	-74	-35
	7 WFC	2	1	0	2	0	-51	-12	-101	-160	-785	-181	-8	-246	-1,618
	8 Inner VA OR	68	60	22	131	24	-9	-47	-36	-39	85	-53	-65	-58	82
	9 VA BL/Yellow	96	30	16	58	12	-63	-19	-189	-255	-249	475	32	126	68
	10 Core OR/BL/SL	213	72	95	294	58	-144	-107	62	134	-635	-384	10	-517	-849
	11 Other Core	139	24	28	85	20	-81	-43	140	541	-476	399	25	-80	719
	12 East BL & OR	27	6	6	80	7	15	-59	22	-10	-470	-139	-408	-543	-1,466
	13 Non-Core	83	48	28	134	30	35	-29	-57	-271	-716	691	189	-1,618	-1,830
Total		711	287	228	936	203	-261	-364	-7	161	-1,888	1,468	-583	-2,788	-1,897

Trips on the project = 5,078

Table A28: Adjusted Rail Trips by Time Period – PM Peak – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR						177	160	1,103	757	7,078	1,646	82	559	11,561
	7 WFC						130	27	758	459	4,083	988	53	387	6,885
	8 Inner VA OR						357	301	895	982	9,574	1,943	147	1,022	15,220
	9 VA BL/Yellow						237	151	1,133	8,939	19,345	9,221	360	3,713	43,099
	10 Core OR/BL/SL	*No Trips in Before Conditions*					875	558	2,432	3,756	14,571	4,878	1,691	4,984	33,745
	11 Other Core						349	205	865	3,403	8,760	12,161	356	11,736	37,829
	12 East BL & OR						128	125	493	1,283	10,508	2,608	1,323	2,784	19,252
	13 Non-Core						418	310	1,624	5,404	25,550	41,422	1,079	28,112	103,908
Total		0	0	0	0	0	2,665	1,837	9,303	24,983	99,469	74,867	5,081	53,296	271,500

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	70	44	184	60	34	5	565	310	3,098	953	20	289	5,656
	2 Spring Hill	43	3	3	27	6	13	1	51	33	258	60	30	31	559
	3 Greensboro	19	3	1	13	8	1	0	31	25	269	49	3	19	440
	4 Tysons Corner	38	32	18	12	31	0	1	124	74	475	136	0	103	1,044
	5 McLean	22	13	9	27	6	4	0	55	56	496	107	3	0	798
	6 Outer VA OR	29	7	11	52	20	131	46	926	610	6,799	1,593	39	500	10,762
	7 WFC	5	2	0	5	1	38	8	251	73	1,505	329	13	106	2,236
	8 Inner VA OR	300	89	183	408	131	301	32	942	684	10,851	2,031	58	1,045	17,054
	9 VA BL/Yellow	43	31	35	76	25	124	33	739	8,261	18,720	11,448	197	3,520	43,252
	10 Core OR/BL/SL	289	93	106	406	122	468	67	1,993	3,257	15,067	4,581	850	3,321	30,623
	11 Other Core	125	33	43	106	44	187	22	738	3,336	8,785	13,540	271	9,612	36,841
	12 East BL & OR	69	0	22	97	21	143	12	492	1,339	10,632	2,452	1,083	2,439	18,802
	13 Non-Core	210	70	96	226	147	336	26	1,469	6,334	27,072	48,678	676	28,966	114,287
Total		1,216	445	572	1,639	621	1,782	253	8,275	24,373	104,027	85,957	3,244	49,950	282,353

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	24	70	44	184	60	34	5	565	310	3,098	953	20	289	5,656
	2 Spring Hill	43	3	3	27	6	13	1	51	33	258	60	30	31	559
	3 Greensboro	19	3	1	13	8	1	0	31	25	269	49	3	19	440
	4 Tysons Corner	38	32	18	12	31	0	1	124	74	475	136	0	103	1,044
	5 McLean	22	13	9	27	6	4	0	55	56	496	107	3	0	798
	6 Outer VA OR	29	7	11	52	20	-46	-114	-177	-147	-279	-53	-42	-59	-800
	7 WFC	5	2	0	5	1	-92	-19	-608	-387	-2,578	-659	-40	-281	-4,650
	8 Inner VA OR	300	89	183	408	131	-56	-269	47	-298	1,277	89	-88	23	1,834
	9 VA BL/Yellow	43	31	35	76	25	-112	-118	-394	-679	624	2,227	-163	-193	153
	10 Core OR/BL/SL	289	93	106	406	122	-407	-491	-439	-499	496	-297	-841	-1,663	3,123
	11 Other Core	125	33	43	106	44	-157	-183	-128	-66	24	1,379	-85	-2,124	-988
	12 East BL & OR	69	0	22	97	21	15	-113	-1	56	123	-156	-240	-344	-450
	13 Non-Core	210	70	96	226	147	-81	-284	-155	910	1,523	2,256	-393	854	10,379
Total		1,216	445	572	1,639	621	-883	1,584	1,028	-610	4,558	11,091	-1,837	-3,346	10,853

Trips on the project = 12,276

Table A29: Adjusted Rail Trips by Time Period – Evening + Late Night – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					67	36	372	140	1,878	629	0	166	3,288
	7 WFC						56	7	180	84	854	294	0	54	1,529
	8 Inner VA OR						148	59	530	306	3,831	882	15	445	6,215
	9 VA BL/Yellow						75	43	410	2,588	4,942	3,699	103	1,212	13,072
	10 Core OR/BL/SL						257	129	849	1,417	4,940	1,511	324	1,586	11,014
	11 Other Core						203	48	357	883	2,370	4,675	159	4,538	13,231
	12 East BL & OR						56	54	152	390	2,344	843	654	1,042	5,536
	13 Non-Core						154	154	587	2,174	7,396	18,788	667	12,523	42,444
	Total	0	0	0	0	0	1,016	530	3,438	7,980	28,556	31,321	1,922	21,566	96,329

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	12	19	46	0	5	1	105	93	564	222	9	60	1,144
	2 Spring Hill	5	2	3	21	1	3	0	15	11	88	28	0	7	183
	3 Greensboro	3	1	2	8	1	0	0	14	9	73	21	0	6	139
	4 Tysons Corner	47	11	9	10	5	2	0	13	40	162	40	5	0	345
	5 McLean	9	4	4	17	1	2	0	38	11	107	28	2	18	240
	6 Outer VA OR	8	7	5	23	1	55	18	258	141	1,486	456	19	187	2,663
	7 WFC	1	0	0	3	0	15	2	49	18	356	83	2	34	563
	8 Inner VA OR	81	31	42	188	0	140	18	426	265	3,560	679	0	398	5,827
	9 VA BL/Yellow	0	9	5	26	3	34	9	229	2,298	4,305	2,805	77	842	10,642
	10 Core OR/BL/SL	73	13	6	126	32	112	52	644	937	4,011	1,112	238	869	8,224
	11 Other Core	13	0	0	25	3	25	9	190	933	1,554	3,797	61	2,659	9,269
	12 East BL & OR	18	12	10	61	3	32	7	124	408	2,219	656	531	914	4,995
	13 Non-Core	60	30	19	159	4	92	26	446	2,171	6,559	17,686	291	11,065	38,608
	Total	325	133	125	711	54	517	142	2,551	7,333	25,043	27,612	1,237	17,059	82,843

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	12	19	46	0	5	1	105	93	564	222	9	60	1,144
	2 Spring Hill	5	2	3	21	1	3	0	15	11	88	28	0	7	183
	3 Greensboro	3	1	2	8	1	0	0	14	9	73	21	0	6	139
	4 Tysons Corner	47	11	9	10	5	2	0	13	40	162	40	5	0	345
	5 McLean	9	4	4	17	1	2	0	38	11	107	28	2	18	240
	6 Outer VA OR	8	7	5	23	1	-13	-17	-115	1	-392	-173	19	21	-624
	7 WFC	1	0	0	3	0	-41	-5	-131	-66	-499	-211	2	-20	-967
	8 Inner VA OR	81	31	42	188	0	-7	-41	-105	-41	-272	-203	-15	-46	-388
	9 VA BL/Yellow	0	9	5	26	3	-41	-34	-181	-290	-637	-894	-25	-370	-2,430
	10 Core OR/BL/SL	73	13	6	126	32	-145	-77	-205	-480	-929	-400	-86	-717	-2,789
	11 Other Core	13	0	0	25	3	-178	-39	-167	50	-815	-878	-97	-1,379	-3,962
	12 East BL & OR	18	12	10	61	3	-24	-47	-28	18	-125	-186	-123	-128	-540
	13 Non-Core	60	30	19	159	4	-61	-128	-141	-4	-838	-1,102	-376	-1,458	-3,836
	Total	325	133	125	711	54	-498	-387	-887	-647	-3,513	-3,709	-685	-4,507	-13,485

Trips on the project = 3,151

A5.4 Station Group to Station Group Ridership – Without Headwind Adjustments

This section documents ridership numbers in which after conditions ridership data have not been adjusted for headwind effects. For data that has been adjusted, see **A5.3 Station Group to Station Group Ridership – With Headwind Adjustments**.

Unadjusted Trips on the Project – After Conditions

Faregate data from before and after conditions was aggregated by station-group to develop origin-destination matrices. On-board rail survey data was aggregated using the same station groups as the faregate data, weighted by station-group OD pair, and used to assess ridership patterns for various demographic characteristics. **Table A30** shows ridership by trip purpose. **Table A31** shows ridership by mode of access. **Table A32** shows ridership by income level. **Table A33** shows ridership by car ownership.

Table A30: Unadjusted Trips on the Project by Trip Purpose

i. All Purposes

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
2	Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
3	Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
4	Tysons Corner	176	74	26	25	66	20	4	276	163	990	235	9	192	2,255
5	McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
6	Outer VA OR	88	18	16	97	42									260
7	WFC	16	4	0	13	1									33
8	Inner VA OR	669	215	357	918	262									2,420
9	VA BL/Yellow	162	96	81	197	68									604
10	Core OR/BL/SL	786	245	305	982	292									2,609
11	Other Core	293	59	97	246	74									770
12	East BL & OR	178	49	61	291	51									630
13	Non-Core	542	197	222	660	238									1,859
Total		3,087	1,174	1,323	3,961	1,246	142	16	1,801	1,146	10,112	2,749	107	1,022	27,884

Trips Not on the Project

iii. Home-Based Other

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	0	6	148	13	41	0	113	96	684	422	26	70	1,620
2	Spring Hill	0	0	0	6	0	12	0	7	8	66	10	0	0	108
3	Greensboro	0	0	0	10	0	0	0	14	10	54	19	0	0	106
4	Tysons Corner	10	0	0	0	0	0	0	76	59	195	28	0	32	399
5	McLean	8	5	0	0	0	4	0	10	22	114	72	0	0	235
6	Outer VA OR	14	0	0	20	0									34
7	WFC	0	0	0	0	0									0
8	Inner VA OR	39	0	25	193	11									267
9	VA BL/Yellow	27	16	15	33	0									91
10	Core OR/BL/SL	108	13	22	110	4									257
11	Other Core	20	21	0	5	0									46
12	East BL & OR	29	2	0	0	0									30
13	Non-Core	105	37	20	147	12									322
Total		342	89	82	508	27	0	0	0	0	0	0	0	0	3,516

Trips Not on the Project

ii. Home-Based Work

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	153	91	176	83	7	0	993	525	5,688	1,461	18	473	9,669
2	Spring Hill	27	0	0	10	0	2	0	14	34	431	54	24	11	607
3	Greensboro	0	0	0	12	7	0	0	31	36	381	66	0	18	551
4	Tysons Corner	108	41	0	0	7	4	0	87	9	566	82	0	37	940
5	McLean	44	0	7	15	0	0	0	73	78	985	151	0	40	1,392
6	Outer VA OR	67	8	10	57	32									174
7	WFC	5	1	0	4	0									9
8	Inner VA OR	572	143	307	682	235									1,939
9	VA BL/Yellow	106	42	48	140	65									402
10	Core OR/BL/SL	434	75	199	579	203									1,490
11	Other Core	120	0	58	117	55									350
12	East BL & OR	133	46	51	279	38									546
13	Non-Core	364	92	196	460	196									1,308
Total		1,979	602	965	2,531	922	13	0	1,198	682	8,051	1,814	42	578	19,378

Trips Not on the Project

iii. Non-Home-Based

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	42	22	21	39	10	17	9	73	122	404	139	8	103	1,009
2	Spring Hill	29	9	9	49	18	19	2	92	24	127	84	7	73	540
3	Greensboro	25	7	11	21	9	16	0	61	14	106	17	11	18	315
4	Tysons Corner	58	33	26	25	59	16	4	113	96	230	125	9	124	916
5	McLean	2	21	14	47	13	5	1	45	14	83	19	4	25	291
6	Outer VA OR	7	10	6	20	10									53
7	WFC	11	4	0	9	1									24
8	Inner VA OR	57	72	26	43	16									213
9	VA BL/Yellow	29	38	18	25	3									111
10	Core OR/BL/SL	244	156	84	292	85									862
11	Other Core	153	38	39	124	19									374
12	East BL & OR	17	1	10	12	13									53
13	Non-Core	73	69	6	53	29									230
Total		748	478	270	758	283	72	16	383	270	949	383	39	342	4,991

Trips Not on the Project

Table A31: Unadjusted Trips on the Project by Access Mode

i. All Access Modes

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
2	Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
3	Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
4	Tysons Corner	159	74	26	25	66	20	4	276	163	990	235	9	192	2,239
5	McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
6	Outer VA OR	88	18	16	97	42									260
7	WFC	16	4	0	13	1									33
8	Inner VA OR	669	215	357	918	262									2,420
9	VA BL/Yellow	162	96	81	197	68									604
10	Core OR/BL/SL	786	245	305	982	292									2,609
11	Other Core	293	59	97	246	74									770
12	East BL & OR	178	49	61	291	51									630
13	Non-Core	542	197	222	660	238									1,859
Total		3,070	1,174	1,323	3,961	1,246	142	16	1,801	1,146	10,112	2,749	107	1,022	27,868

Trips Not on the Project

ii. Walk

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	27	17	39	13	7	0	95	59	437	119	7	121	941
2	Spring Hill	25	0	0	10	10	12	0	29	24	263	0	0	11	384
3	Greensboro	6	0	0	12	7	0	0	11	26	239	22	0	20	342
4	Tysons Corner	13	10	0	0	14	2	0	150	95	458	121	5	85	952
5	McLean	14	5	7	38	0	4	0	58	42	434	78	0	39	719
6	Outer VA OR	4	6	0	47	32									89
7	WFC	0	0	0	4	0									4
8	Inner VA OR	414	115	283	737	222									1,771
9	VA BL/Yellow	52	51	53	71	49									275
10	Core OR/BL/SL	356	203	221	659	187									1,626
11	Other Core	118	30	90	142	57									438
12	East BL & OR	78	44	10	41	12									185
13	Non-Core	216	57	114	339	171									898
Total		1,295	550	794	2,139	774	25	0	343	245	1,832	339	11	275	8,623

Trips Not on the Project

iii. Bus

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	102	68	215	80	22	0	463	226	1,889	571	0	168	3,805
2	Spring Hill	27	0	0	7	0	0	0	0	10	91	0	24	19	178
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Tysons Corner	105	41	0	0	7	0	0	68	37	256	47	0	70	630
5	McLean	5	0	0	0	0	0	0	27	27	147	5	0	0	211
6	Outer VA OR	51	0	0	16	0									67
7	WFC	5	1	0	0	0									5
8	Inner VA OR	129	17	44	101	21									312
9	VA BL/Yellow	38	14	0	29	5									86
10	Core OR/BL/SL	171	30	32	111	32									376
11	Other Core	86	0	0	0	0									86
12	East BL & OR	42	0	5	110	14									171
13	Non-Core	153	45	37	189	28									452
Total		811	249	187	778	187	22	0	558	300	2,383	624	24	258	6,379

Trips Not on the Project

iv. Park & Ride

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	12	12	79	8	0	0	416	294	3,372	1,054	13	230	5,491
2	Spring Hill	0	0	0	30	0	0	0	0	14	108	20	0	0	172
3	Greensboro	0	0	0	0	0	0	0	0	10	115	27	0	6	158
4	Tysons Corner	10	0	0	0	0	2	0	32	0	198	20	0	11	274
5	McLean	0	0	0	0	0	0	0	20	5	365	45	0	0	434
6	Outer VA OR	0	2	0	0	0									2
7	WFC	0	0	0	0	0									0
8	Inner VA OR	0	0	0	11	4									15
9	VA BL/Yellow	14	6	0	27	5									53
10	Core OR/BL/SL	125	6	27	98	23									278
11	Other Core	14	0	0	36	14									64
12	East BL & OR	39	2	10	85	9									145
13	Non-Core	70	9	40	5	22									146
Total		272	37	88	370	85	2	0	468	324	4,158	1,166	13	247	7,230

Trips Not on the Project

v. Kiss & Ride

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	35	0	20	0	5	0	136	118	649	209	0	100	1,272
2	Spring Hill	0	0	0	0	0	2	0	14	0	79	34	0	11	140
3	Greensboro	0	0	0	0	0	0	0	29	0	157	33	0	6	225
4	Tysons Corner	10	0	0	0	7	0	0	10	4	72	17	0	0	120
5	McLean	14	0	0	0	0	0	0	4	21	154	114	0	17	323
6	Outer VA OR	14	0	0	0	0									14
7	WFC	0	0	0	0	0									0
8	Inner VA OR	86	43	10	11	0									150
9	VA BL/Yellow	25	8	0	0	0									33
10	Core OR/BL/SL	30	6	10	40	9									95
11	Other Core	0	0	7	44	0									51
12	East BL & OR	20	0	1	37	4									62
13	Non-Core	51	26	20	71	17									184
Total		249	118	48	223	37	7	0	192	143	1,111	408	0	133	2,670

Trips Not on the Project

vi. Other

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	42	0	21	10	5	32	9	69	45	429	68	32	26	789
2	Spring Hill	4	9	9	18	7	19	2	69	18	82	94	7	44	381
3	Greensboro	19	7	11	31	9	16	0	65	24	29	21	11	6	247
4	Tysons Corner	21	23	26	25	39	16	4	17	28	5	29	4	25	262
5	McLean	21	21	14	24	13	5	1	18	19	82	0	4	9	230
6	Outer VA OR	20	10	16	34	10									89
7	WFC	11	4	0	9	1									24
8	Inner VA OR	40	40	20	58	15									173
9	VA BL/Yellow	34	17	29	71	8									158
10	Core OR/BL/SL	104	0	14	74	42									234
11	Other Core	75	29	0	24	3									131
12	East BL & OR	0	3	35	17	12									67
13	Non-Core	52	60	11	57	0									179
Total		443	220	205	451	164	86	16	239	134	628	211	58	109	2,966

Trips Not on the Project

Table A32: Unadjusted Trips on the Project by Income

i. All Incomes

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	21	137	97	340	106	49	0	1,044	691	5,843	1,613	28	551	10,520
2	Spring Hill	27	0	0	47	10	14	0	54	42	573	44	24	50	885
3	Greensboro	6	0	0	21	7	0	0	53	36	437	62	0	31	654
4	Tysons Corner	135	51	0	0	27	4	0	260	151	889	201	5	192	1,913
5	McLean	44	5	7	38	0	4	0	105	94	1,014	207	0	56	1,575
6	Outer VA OR	81	8	10	63	32									194
7	WFC	5	1	0	4	0									9
8	Inner VA OR	587	169	306	789	241									2,092
9	VA BL/Yellow	162	88	35	181	65									531
10	Core OR/BL/SL	706	204	286	975	271									2,442
11	Other Core	293	30	78	234	71									707
12	East BL & OR	178	48	50	287	43									606
13	Non-Core	476	127	205	593	231									1,632
Total		2,720	868	1,074	3,572	1,106	70	0	1,515	1,014	8,756	2,127	57	880	23,761

Trips Not on the Project

ii. <$50k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	21	35	12	76	12	37	0	65	39	476	176	7	77	1,033
2	Spring Hill	0	0	0	0	0	6	0	11	8	42	10	24	21	122
3	Greensboro	0	0	0	0	0	0	0	0	0	59	0	0	0	59
4	Tysons Corner	53	16	0	0	0	2	0	15	71	134	20	5	101	417
5	McLean	6	0	7	23	0	4	0	70	5	100	5	0	0	220
6	Outer VA OR	51	0	0	31	9									91
7	WFC	0	0	0	0	0									0
8	Inner VA OR	111	31	48	122	6									317
9	VA BL/Yellow	43	37	0	45	11									136
10	Core OR/BL/SL	123	82	12	174	29									421
11	Other Core	17	10	8	56	0									91
12	East BL & OR	77	46	40	153	13									330
13	Non-Core	148	55	26	281	90									602
Total		650	312	152	963	170	48	0	162	123	812	212	35	199	3,838

Trips Not on the Project

iii. $50k-$75k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	8	0	70	8	7	0	158	134	462	62	0	61	971
2	Spring Hill	0	0	0	7	0	2	0	0	10	38	0	0	11	68
3	Greensboro	0	0	0	21	0	0	0	33	0	70	4	0	4	131
4	Tysons Corner	69	0	0	0	0	0	0	107	39	199	37	0	11	463
5	McLean	0	0	0	15	0	0	0	0	48	71	0	0	36	169
6	Outer VA OR	0	0	0	2	0									2
7	WFC	0	1	0	4	0									5
8	Inner VA OR	128	11	57	138	17									351
9	VA BL/Yellow	71	0	0	62	16									149
10	Core OR/BL/SL	116	58	104	126	17									421
11	Other Core	99	0	22	20	16									156
12	East BL & OR	44	0	0	44	9									97
13	Non-Core	74	18	85	136	57									370
Total		600	95	267	645	140	10	0	297	231	840	103	0	123	3,352

Trips Not on the Project

iv. $75k-$100k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	0	0	50	13	0	0	185	80	761	117	0	144	1,351
2	Spring Hill	0	0	0	0	0	0	0	7	10	124	10	0	8	159
3	Greensboro	0	0	0	0	0	0	0	0	10	53	4	0	0	67
4	Tysons Corner	13	0	0	0	14	0	0	58	4	90	25	0	30	234
5	McLean	9	0	0	0	0	0	0	22	0	132	45	0	3	211
6	Outer VA OR	4	6	10	28	0									47
7	WFC	0	0	0	0	0									0
8	Inner VA OR	121	41	38	170	67									437
9	VA BL/Yellow	21	22	0	8	11									61
10	Core OR/BL/SL	114	0	38	185	66									404
11	Other Core	35	21	4	12	21									94
12	East BL & OR	16	0	0	18	12									45
13	Non-Core	51	46	34	36	44									211
Total		384	134	124	509	248	0	0	271	105	1,161	201	0	186	3,322

Trips Not on the Project

v. >$100k

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	94	85	144	73	5	0	636	437	4,143	1,257	22	269	7,166
2	Spring Hill	27	0	0	39	10	6	0	36	14	368	24	0	11	535
3	Greensboro	6	0	0	0	7	0	0	20	26	255	54	0	27	396
4	Tysons Corner	0	35	0	0	14	2	0	80	36	465	118	0	49	800
5	McLean	29	5	0	0	0	0	0	13	42	712	157	0	17	974
6	Outer VA OR	27	2	0	2	24									54
7	WFC	5	0	0	0	0									5
8	Inner VA OR	227	86	164	358	151									987
9	VA BL/Yellow	28	29	35	66	27									185
10	Core OR/BL/SL	352	64	132	490	159									1,197
11	Other Core	142	0	45	146	34									367
12	East BL & OR	42	2	10	71	9									133
13	Non-Core	202	9	60	139	40									450
Total		1,086	327	531	1,455	548	13	0	785	555	5,943	1,611	22	373	13,250

Trips Not on the Project

Table A33: Unadjusted Trips on the Project by Income

i. All Levels of Ownership

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	21	176	97	363	106	49	0	1,180	743	6,739	2,011	44	646	12,174
2	Spring Hill	52	0	0	47	10	12	0	54	56	623	64	24	50	993
3	Greensboro	6	0	0	21	7	0	0	57	46	537	85	0	31	790
4	Tysons Corner	154	51	0	0	27	4	0	276	151	990	206	5	192	2,056
5	McLean	52	5	7	38	0	4	0	112	99	1,182	242	0	56	1,797
6	Outer VA OR	81	8	10	77	32									208
7	WFC	5	1	0	4	0									9
8	Inner VA OR	669	188	357	918	262									2,393
9	VA BL/Yellow	162	88	68	197	65									580
10	Core OR/BL/SL	786	245	305	982	292									2,609
11	Other Core	293	30	97	246	71									739
12	East BL & OR	178	48	51	287	43									607
13	Non-Core	531	138	222	660	238									1,788
Total		2,990	977	1,213	3,840	1,154	68	0	1,680	1,095	10,071	2,608	73	975	26,743

Trips Not on the Project

iii. 1 Vehicle

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	28	60	107	50	11	0	389	177	1,657	450	16	175	3,119
2	Spring Hill	0	0	0	17	5	6	0	34	24	165	50	0	11	312
3	Greensboro	6	0	0	10	7	0	0	44	0	123	48	0	6	243
4	Tysons Corner	86	0	0	0	7	2	0	132	35	415	89	0	38	804
5	McLean	22	5	0	23	0	4	0	43	20	369	77	0	7	570
6	Outer VA OR	14	0	10	16	24									63
7	WFC	5	0	0	0	0									5
8	Inner VA OR	312	55	145	292	133									937
9	VA BL/Yellow	45	57	33	77	5									219
10	Core OR/BL/SL	240	97	131	304	65									837
11	Other Core	120	21	26	60	11									237
12	East BL & OR	68	0	36	143	14									261
13	Non-Core	307	28	81	230	73									719
Total		1,225	292	521	1,280	393	22	0	641	256	2,729	715	16	236	8,326

Trips Not on the Project

ii. 0 Vehicles

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	32	12	85	9	7	0	68	46	211	22	7	68	566
2	Spring Hill	12	0	0	0	0	0	0	7	8	102	0	24	32	185
3	Greensboro	0	0	0	12	0	0	0	0	0	86	0	0	11	109
4	Tysons Corner	68	51	0	0	14	0	0	72	75	98	6	5	116	506
5	McLean	5	0	3	15	0	0	0	49	11	59	5	0	16	162
6	Outer VA OR	67	0	0	31	9									107
7	WFC	0	1	0	4	0									5
8	Inner VA OR	221	41	138	474	80									954
9	VA BL/Yellow	64	14	0	64	54									198
10	Core OR/BL/SL	204	54	136	474	160									1,029
11	Other Core	72	10	56	106	41									285
12	East BL & OR	44	46	5	57	16									169
13	Non-Core	178	75	78	357	159									847
Total		937	323	428	1,680	541	7	0	196	140	556	33	35	242	5,120

Trips Not on the Project

iv. 2+ Vehicles

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	21	116	26	171	47	30	0	723	520	4,871	1,540	22	403	8,489
2	Spring Hill	40	0	0	30	5	6	0	14	24	356	14	0	8	496
3	Greensboro	0	0	0	0	0	0	0	14	46	328	37	0	15	438
4	Tysons Corner	0	0	0	0	7	2	0	72	41	477	110	0	38	746
5	McLean	26	0	4	0	0	0	0	21	69	754	159	0	33	1,065
6	Outer VA OR	0	8	0	30	0									38
7	WFC	0	0	0	0	0									0
8	Inner VA OR	135	92	74	152	49									503
9	VA BL/Yellow	32	16	35	55	5									164
10	Core OR/BL/SL	342	93	37	204	67									743
11	Other Core	101	0	16	80	20									217
12	East BL & OR	66	2	10	86	14									177
13	Non-Core	45	35	63	73	6									222
Total		828	362	264	881	219	38	0	843	699	6,785	1,860	22	497	13,298

Trips Not on the Project

A5.4.1 Change in Unadjusted Rail Trips – Station-Group to Station-Group

Faregate data from the before and after conditions was aggregated by station-group to develop origin-destination matrices. On-board rail survey data was aggregated using the same station groups as the faregate data, weighted by station-group OD pair, and used to assess ridership patterns for various demographic characteristics.

The tables included in this section show station-group to station-group ridership in before conditions, after conditions, and the change between before and after conditions. In this section, after conditions data is not headwind-adjusted. For headwind-adjusted data, see **A5.3 Station Group to Station Group Ridership – With Headwind Adjustments**.

Table A34 through **Table A37** show a before & after comparison of ridership by trip purpose. **Table A38** through **Table A43** show a before & after comparison of ridership by mode of access. **Table A44** through **Table A48** show a before & after comparison of ridership by income. **Table A49** through **Table A52** show a before & after comparison of ridership by car ownership. **Table A53** through **Table A57** show a before & after comparison of ridership by time of day.

Table A34: Unadjusted Rail Trips by Trip Purpose – All Purposes – Before Conditions

Before			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6	Outer VA OR	*No Trips in Before Conditions*					482	474	2,898	2,027	19,271	4,279	212	1,723	31,366
	7	WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
	8	Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
	9	VA BL/Yellow						625	406	3,058	24,911	51,306	24,754	780	9,680	115,519
	10	Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
	11	Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
	12	East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
	13	Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total			0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
	2	Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
	3	Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
	4	Tysons Corner	176	74	26	25	66	20	4	276	163	990	235	9	192	2,255
	5	McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
	6	Outer VA OR	88	18	16	97	42	319	126	2,010	1,486	15,558	3,609	112	1,289	24,769
	7	WFC	16	4	0	13	1	95	17	306	164	3,335	679	29	249	4,908
	8	Inner VA OR	669	215	357	918	262	769	85	2,125	1,746	25,367	4,464	115	2,470	39,560
	9	VA BL/Yellow	162	96	81	197	68	258	85	1,685	20,345	42,788	24,618	536	8,316	99,236
	10	Core OR/BL/SL	786	245	305	982	292	1,102	194	5,144	8,847	37,376	10,628	2,357	8,555	76,814
	11	Other Core	293	59	97	246	74	346	83	1,543	7,759	18,866	29,639	695	22,151	81,853
	12	East BL & OR	178	49	61	291	51	368	44	1,201	3,364	24,300	5,815	2,987	6,225	44,934
	13	Non-Core	542	197	222	660	238	840	74	3,546	15,551	64,166	115,951	2,174	72,293	276,452
Total			3,087	1,174	1,323	3,961	1,246	4,239	724	19,362	60,408	241,868	198,153	9,111	122,570	667,224

Trips on the project = 27,884

Change			Attraction Station-Group													Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
	2	Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
	3	Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
	4	Tysons Corner	176	74	26	25	66	20	4	276	163	990	235	9	192	2,255
	5	McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
	6	Outer VA OR	88	18	16	97	42	-163	-348	-888	-541	-3,711	-670	-100	-433	-4,587
	7	WFC	16	4	0	13	1	-267	-48	-1,560	-997	-7,229	-1,866	-92	-814	-12,840
	8	Inner VA OR	669	215	357	918	262	-230	-632	-450	-842	-1,375	-830	-216	-296	-2,452
	9	VA BL/Yellow	162	96	81	197	68	-367	-321	-1,373	-4,566	-8,518	-136	-244	-1,364	-16,284
	10	Core OR/BL/SL	786	245	305	982	292	-800	-1,038	-789	-1,974	-5,924	-2,546	-1,078	-1,738	-14,956
	11	Other Core	293	59	97	246	74	-471	-342	-262	-19	-3,860	-2,334	-156	-6,102	-12,774
	12	East BL & OR	178	49	61	291	51	5	-388	-258	-468	-4,648	-1,628	-3,442	-2,277	-10,473
	13	Non-Core	542	197	222	660	238	-246	-843	-1,044	-1,294	-8,384	-5,988	-1,675	-11,240	-29,854
Total			3,087	1,174	1,323	3,961	1,246	-2,397	-3,922	-4,824	-9,254	-34,540	-13,250	-4,895	-25,241	-87,532

Table A35: Unadjusted Rail Trips by Trip Purpose – Home-Based Work – Before Conditions

Before			Attraction Station-Group												Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6	Outer VA OR	*No Trips in Before Conditions*					294	282	2,125	1,664	16,475	2,998	131	1,219	25,189
	7	WFC						189	0	1,592	934	9,153	1,879	88	701	14,535
	8	Inner VA OR						566	555	1,162	1,751	20,743	3,463	169	1,689	30,097
	9	VA BL/Yellow						357	324	1,969	17,670	40,912	17,106	338	6,130	84,806
	10	Core OR/BL/SL						638	571	2,811	4,696	24,293	5,579	1,129	4,674	44,392
	11	Other Core						306	265	1,011	4,393	14,648	17,448	306	13,200	51,578
	12	East BL & OR						246	348	1,201	3,147	24,778	5,601	2,257	5,836	43,414
	13	Non-Core						809	713	3,372	12,578	60,173	90,768	2,041	54,373	224,827
Total			0	0	0	0	0	3,405	3,057	15,241	46,834	211,176	144,843	6,460	87,821	518,837

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After			Attraction Station-Group												Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	153	91	176	83	7	0	993	525	5,688	1,461	18	473	9,669
	2	Spring Hill	27	0	0	10	0	2	0	14	34	431	54	24	11	607
	3	Greensboro	0	0	0	12	7	0	0	31	36	381	66	0	18	551
	4	Tysons Corner	108	41	0	0	7	4	0	87	9	566	82	0	37	940
	5	McLean	44	0	7	15	0	0	0	73	78	985	151	0	40	1,392
	6	Outer VA OR	67	8	10	57	32	158	69	1,632	1,189	13,603	2,849	89	939	20,702
	7	WFC	5	1	0	4	0	32	0	211	159	2,803	517	6	150	3,886
	8	Inner VA OR	572	143	307	682	235	473	26	1,060	1,132	19,645	3,241	55	1,744	29,316
	9	VA BL/Yellow	106	42	48	140	65	154	12	1,018	13,940	33,567	18,852	317	5,436	73,699
	10	Core OR/BL/SL	434	75	199	579	203	546	52	2,847	3,872	21,106	4,975	1,004	3,676	39,568
	11	Other Core	120	0	58	117	55	181	13	940	4,423	11,634	16,472	339	10,907	45,260
	12	East BL & OR	133	46	51	279	38	286	13	1,049	2,842	20,143	4,470	1,759	4,331	35,440
	13	Non-Core	364	92	196	460	196	594	40	2,860	11,655	51,378	86,154	1,022	46,787	201,796
Total			1,979	602	965	2,531	922	2,438	225	12,815	39,892	181,929	139,345	4,633	74,548	462,825

Change			Attraction Station-Group												Total
			1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1	Wiehle	0	153	91	176	83	7	0	993	525	5,688	1,461	18	473	9,669
	2	Spring Hill	27	0	0	10	0	2	0	14	34	431	54	24	11	607
	3	Greensboro	0	0	0	12	7	0	0	31	36	381	66	0	18	551
	4	Tysons Corner	108	41	0	0	7	4	0	87	9	566	82	0	37	940
	5	McLean	44	0	7	15	0	0	0	73	78	985	151	0	40	1,392
	6	Outer VA OR	67	8	10	57	32	-137	-213	-494	-475	-2,872	-150	-42	-279	-4,487
	7	WFC	5	1	0	4	0	-157	0	1,381	-775	-6,350	-1,362	-82	-551	-10,649
	8	Inner VA OR	572	143	307	682	235	-93	-529	-101	-619	-1,098	-222	-114	55	-781
	9	VA BL/Yellow	106	42	48	140	65	-203	-312	-950	-3,730	-7,345	1,746	-21	-694	-11,107
	10	Core OR/BL/SL	434	75	199	579	203	-92	-520	36	-824	-3,188	-604	-125	-998	-4,824
	11	Other Core	120	0	58	117	55	-124	-252	-71	29	-3,014	-976	33	-7,293	-6,818
	12	East BL & OR	133	46	51	279	38	40	-335	-152	-305	-4,635	1,131	-497	-1,505	-7,974
	13	Non-Core	364	92	196	460	196	-215	-673	-512	-924	-8,796	-4,614	-1,019	-7,586	-28,031
Total			1,979	602	965	2,531	922	-967	-2,832	-2,427	-6,941	-29,246	-5,498	-1,826	-13,273	-56,012

Trips on the project = 19,378

Table A36: Unadjusted Rail Trips by Trip Purpose – Home-Based Other – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					106	171	630	268	2,275	1,002	50	383	4,885
	7 WFC						118	0	164	143	1,064	534	5	189	2,217
	8 Inner VA OR						261	67	1,000	534	4,325	1,295	76	598	8,156
	9 VA BL/Yellow						139	33	657	3,799	6,168	4,961	188	2,012	17,958
	10 Core OR/BL/SL						251	199	1,026	1,564	6,214	2,104	803	2,292	14,454
	11 Other Core						148	24	325	1,085	2,600	5,679	166	5,335	15,364
	12 East BL & OR						63	69	176	530	3,196	1,413	1,564	2,040	9,051
	13 Non-Core						109	111	831	2,916	8,873	22,744	1,184	18,946	55,714
Total		0	0	0	0	0	1,194	675	4,810	10,840	34,715	39,733	4,038	31,795	127,798

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	6	148	13	41	0	113	96	684	422	26	70	1,620
	2 Spring Hill	0	0	0	6	0	12	0	7	8	66	10	0	0	108
	3 Greensboro	0	0	0	10	0	0	0	14	10	54	19	0	0	106
	4 Tysons Corner	10	0	0	0	0	0	0	76	59	195	28	0	32	399
	5 McLean	8	5	0	0	0	4	0	10	22	114	72	0	0	235
	6 Outer VA OR	14	0	0	20	0	81	24	307	257	1,302	566	0	194	2,765
	7 WFC	0	0	0	0	0	54	0	60	0	364	129	11	66	684
	8 Inner VA OR	39	0	25	193	11	197	22	674	370	3,673	754	35	457	6,451
	9 VA BL/Yellow	27	16	15	33	0	68	42	472	2,815	5,398	3,923	119	1,735	14,662
	10 Core OR/BL/SL	108	13	22	110	4	145	30	747	1,401	5,731	1,584	552	1,731	12,178
	11 Other Core	20	21	0	5	0	53	24	229	1,185	2,071	4,560	128	3,970	12,266
	12 East BL & OR	29	2	0	0	0	32	0	115	353	2,763	1,078	822	1,389	6,583
	13 Non-Core	105	37	20	147	12	160	11	414	2,560	8,075	20,891	777	16,880	50,091
Total		360	94	88	671	40	847	155	3,236	9,136	30,489	34,036	2,470	26,523	108,147

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	6	148	13	41	0	113	96	684	422	26	70	1,620
	2 Spring Hill	0	0	0	6	0	12	0	7	8	66	10	0	0	108
	3 Greensboro	0	0	0	10	0	0	0	14	10	54	19	0	0	106
	4 Tysons Corner	10	0	0	0	0	0	0	76	59	195	28	0	32	399
	5 McLean	8	5	0	0	0	4	0	10	22	114	72	0	0	235
	6 Outer VA OR	14	0	0	20	0	-25	-146	-324	-12	-973	-436	-50	-188	-2,121
	7 WFC	0	0	0	0	0	-64	0	-104	-143	-700	-405	6	-122	-1,532
	8 Inner VA OR	39	0	25	193	11	-63	-44	-326	-164	-651	-540	-41	-141	-1,705
	9 VA BL/Yellow	27	16	15	33	0	-70	9	-185	-984	-771	-1,099	-70	-277	-3,296
	10 Core OR/BL/SL	108	13	22	110	4	-106	-169	-279	-163	-483	-521	-252	-562	-2,276
	11 Other Core	20	21	0	5	0	-95	1	-97	100	-529	-1,119	-38	-1,166	-3,088
	12 East BL & OR	29	2	0	0	0	-31	-69	-62	-176	-433	-334	-742	-651	-2,468
	13 Non-Core	105	37	20	147	12	52	-100	-416	-356	-798	-1,853	-407	-1,066	-5,620
Total		360	94	88	671	40	-347	-520	-1,574	-1,703	-4,225	-5,697	-1,567	-5,271	19,651

Trips on the project = 3,516

Table A37: Unadjusted Rail Trips by Trip Purpose – Non-Home-Based – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR						82	22	143	95	521	278	31	122	1,292
	7 WFC						55	65	111	84	348	131	29	173	996
	8 Inner VA OR						172	95	413	302	1,675	537	86	479	3,759
	9 VA BL/Yellow						129	49	432	3,441	4,225	2,687	254	1,538	12,755
	10 Core OR/BL/SL	*No Trips in Before Conditions*					1,013	439	2,097	4,262	12,793	5,491	1,500	5,328	32,924
	11 Other Core						363	137	469	2,298	5,479	8,845	378	9,715	27,685
	12 East BL & OR						55	14	82	155	973	430	607	626	2,943
	13 Non-Core						169	93	387	1,351	4,503	8,427	623	10,214	25,766
Total		0	0	0	0	0	2,037	913	4,134	11,989	30,518	26,827	3,508	28,195	108,120

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	22	21	39	10	17	9	73	122	404	139	8	103	1,009
	2 Spring Hill	29	9	9	49	18	19	2	92	24	127	84	7	73	540
	3 Greensboro	25	7	11	21	9	16	0	61	14	106	17	11	18	315
	4 Tysons Corner	58	33	26	25	59	16	4	113	96	230	125	9	124	916
	5 McLean	2	21	14	47	13	5	1	45	14	83	19	4	25	291
	6 Outer VA OR	7	10	6	20	10	80	33	72	40	653	194	23	156	1,303
	7 WFC	11	4	0	9	1	9	17	35	6	169	34	12	33	338
	8 Inner VA OR	57	72	26	43	16	98	37	391	244	2,049	468	25	269	3,794
	9 VA BL/Yellow	29	38	18	25	3	36	31	195	3,589	3,823	1,843	101	1,145	10,874
	10 Core OR/BL/SL	244	156	84	292	85	410	112	1,550	3,575	10,539	4,069	801	3,149	25,068
	11 Other Core	153	38	39	124	19	112	46	374	2,151	5,162	8,607	228	7,274	24,327
	12 East BL & OR	17	1	10	12	13	51	30	38	169	1,393	267	405	506	2,912
	13 Non-Core	73	69	6	53	29	86	22	272	1,336	4,713	8,906	374	8,626	24,565
Total		748	478	270	758	283	954	344	3,311	11,379	29,450	24,772	2,007	21,499	96,252

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	22	21	39	10	17	9	73	122	404	139	8	103	1,009
	2 Spring Hill	29	9	9	49	18	19	2	92	24	127	84	7	73	540
	3 Greensboro	25	7	11	21	9	16	0	61	14	106	17	11	18	315
	4 Tysons Corner	58	33	26	25	59	16	4	113	96	230	125	9	124	916
	5 McLean	2	21	14	47	13	5	1	45	14	83	19	4	25	291
	6 Outer VA OR	7	10	6	20	10	-1	11	-71	-54	132	-85	-8	34	11
	7 WFC	11	4	0	9	1	-45	-48	-76	-79	-180	-98	-17	-141	-658
	8 Inner VA OR	57	72	26	43	16	-74	-59	-22	-59	374	-68	-61	-210	35
	9 VA BL/Yellow	29	38	18	25	3	-93	-18	-237	148	-402	-843	-153	-393	-1,881
	10 Core OR/BL/SL	244	156	84	292	85	-602	-327	-547	-687	-2,254	-1,422	-699	-2,379	-7,856
	11 Other Core	153	38	39	124	19	-251	-91	-95	-148	-317	-218	-151	-2,441	-3,858
	12 East BL & OR	17	1	10	12	13	-4	16	-44	14	420	-163	-203	-121	-31
	13 Non-Core	73	69	6	53	29	-83	-71	-115	-15	210	479	-248	-1,588	-1,200
Total		748	478	270	758	283	-1,083	-569	-824	-610	-1,068	-2,055	-1,501	-6,696	-11,869

Trips on the project = 4,991

Table A38: Unadjusted Rail Trips by Access Mode – All Access Modes

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					482	474	2,898	2,027	19,271	4,279	212	1,723	31,366
	7 WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
	8 Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
	9 VA BL/Yellow						625	406	3,058	24,911	51,306	24,754	780	9,680	115,519
	10 Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
	11 Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
	12 East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
	13 Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total		0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
	2 Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
	3 Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
	4 Tysons Corner	159	74	26	25	66	20	4	276	163	990	235	9	192	2,239
	5 McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
	6 Outer VA OR	88	18	16	97	42	319	126	2,010	1,486	15,558	3,609	112	1,289	24,769
	7 WFC	16	4	0	13	1	95	17	306	164	3,335	679	29	249	4,908
	8 Inner VA OR	669	215	357	918	262	769	85	2,125	1,737	25,367	4,464	115	2,470	39,551
	9 VA BL/Yellow	162	96	81	197	68	258	85	1,685	20,333	42,776	24,618	536	8,316	99,212
	10 Core OR/BL/SL	786	245	305	982	292	1,102	194	5,144	8,847	37,376	10,628	2,357	8,555	76,814
	11 Other Core	293	59	97	246	74	346	83	1,543	7,759	18,866	29,639	695	22,151	81,853
	12 East BL & OR	178	49	61	291	51	368	44	1,201	3,364	24,300	5,815	2,987	6,225	44,934
	13 Non-Core	542	197	222	660	238	840	74	3,546	15,551	64,166	115,928	2,174	72,260	276,397
Total		3,070	1,174	1,323	3,961	1,246	4,239	724	19,362	60,387	241,857	198,129	9,111	122,538	667,119

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
2	Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
3	Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
4	Tysons Corner	159	74	26	25	66	20	4	276	163	990	235	9	192	2,239
5	McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
6	Outer VA OR	88	18	16	97	42	-163	-348	-888	-541	-3,713	-670	-100	-433	-6,597
7	WFC	16	4	0	13	1	-267	-48	-1,560	-997	-7,229	-1,866	-92	-814	-12,840
8	Inner VA OR	669	215	357	918	262	-230	632	-450	-851	-1,375	-830	-216	-296	-2,461
9	VA BL/Yellow	162	96	81	197	68	-367	-321	-1,373	-4,578	-4,530	-136	-244	-1,364	-16,565
10	Core OR/BL/SL	786	245	305	982	292	-800	-1,016	-789	-1,679	-5,924	-2,546	-1,076	-3,739	-14,956
11	Other Core	293	59	97	246	74	-471	-342	-262	-19	-3,888	-2,334	-156	-6,100	-13,774
12	East BL & OR	178	49	61	291	51	5	-388	-258	468	-4,648	-1,638	-1,442	-2,277	-10,473
13	Non-Core	542	197	222	660	238	-246	-843	-1,044	-1,294	-9,389	-6,012	-1,675	-11,271	-29,910
Total		3,070	1,174	1,323	3,961	1,246	-2,397	-3,922	-4,824	-9,276	34,552	-13,273	-4,895	-25,273	-87,637

Trips on the project = 27,868

Table A39: Unadjusted Rail Trips by Access Mode – Walk – Before Conditions

Before		Attraction Station-Group												Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					86	138	677	402	3,226	701	46	312	5,588
	7 WFC						29	0	237	155	775	254	0	98	1,538
	8 Inner VA OR						687	509	1,884	2,015	17,477	3,386	151	1,875	27,983
	9 VA BL/Yellow						244	89	1,128	7,849	17,699	8,782	170	3,259	39,219
	10 Core OR/BL/SL						1,281	740	4,127	6,972	31,431	9,101	2,102	8,585	64,339
	11 Other Core						457	298	1,263	4,969	14,217	20,787	521	20,247	62,759
	12 East BL & OR						34	84	156	641	3,224	1,261	1,051	2,239	8,691
	13 Non-Core						484	545	2,007	6,814	28,541	55,518	1,614	41,559	137,082
Total		0	0	0	0	0	3,291	2,403	11,478	29,817	116,592	99,790	5,654	78,175	347,200

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	27	17	39	13	7	0	95	59	437	119	7	121	941
	2 Spring Hill	25	0	0	10	10	12	0	29	24	263	0	0	11	384
	3 Greensboro	6	0	0	12	7	0	0	11	26	239	22	0	20	342
	4 Tysons Corner	13	10	0	0	14	2	0	150	95	458	121	5	85	952
	5 McLean	14	5	7	38	0	4	0	58	42	434	78	0	39	719
	6 Outer VA OR	4	6	0	47	32	181	24	543	444	3,614	729	41	356	6,021
	7 WFC	0	0	0	4	0	29	0	39	5	793	112	6	153	1,140
	8 Inner VA OR	414	115	283	737	222	461	41	1,734	1,325	17,743	2,831	19	1,753	27,679
	9 VA BL/Yellow	52	51	53	71	49	78	0	862	7,270	17,398	9,672	168	3,307	39,031
	10 Core OR/BL/SL	356	203	221	659	187	474	75	3,383	4,998	27,675	6,771	559	4,263	49,824
	11 Other Core	118	30	90	142	57	119	25	1,040	6,499	11,930	18,429	364	13,439	50,293
	12 East BL & OR	78	44	10	41	12	53	0	222	675	4,034	1,138	676	1,678	8,661
	13 Non-Core	216	57	114	339	171	359	28	1,749	6,994	26,972	55,017	790	34,906	127,712
Total		1,295	550	794	2,139	774	1,780	193	9,915	26,456	111,991	95,039	2,634	60,130	313,689

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	27	17	39	13	7	0	95	59	437	119	7	121	941
2	Spring Hill	25	0	0	10	10	12	0	29	24	263	0	0	11	384
3	Greensboro	6	0	0	12	7	0	0	11	26	239	22	0	20	342
4	Tysons Corner	13	10	0	0	14	2	0	150	95	458	121	5	85	952
5	McLean	14	5	7	38	0	4	0	58	42	434	78	0	39	719
6	Outer VA OR	4	6	0	47	32	95	-114	-133	42	388	28	-5	44	433
7	WFC	0	0	0	4	0	10	0	-198	-250	18	-143	6	55	-398
8	Inner VA OR	414	115	283	737	222	-226	-467	-150	-689	266	-555	-132	-122	-304
9	VA BL/Yellow	52	51	53	71	49	-166	-89	-265	-579	-301	891	-2	48	-188
10	Core OR/BL/SL	356	203	221	659	187	-807	-665	-745	1,974	-3,757	-3,330	-1,543	-4,322	-14,516
11	Other Core	118	30	90	142	57	-338	-273	-223	-470	-2,287	-2,357	-157	-6,809	-12,475
12	East BL & OR	78	44	10	41	12	19	-84	67	33	810	-123	-375	-562	-30
13	Non-Core	216	57	114	339	171	-125	-517	-258	180	-1,570	-501	-824	-6,657	-9,370
Total		1,295	550	794	2,139	774	-1,512	-2,210	-1,561	-3,361	-4,601	-4,750	-3,021	18,046	-33,511

Trips on the project = 8,623

Table A40: Unadjusted Rail Trips by Access Mode – Bus – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					299	249	872	540	3,465	743	74	419	6,660
	7 WFC						307	0	1,361	643	4,974	1,099	87	509	8,980
	8 Inner VA OR						139	95	261	276	2,884	411	120	261	4,448
	9 VA BL/Yellow						211	157	857	5,147	13,708	6,147	226	2,842	29,296
	10 Core OR/BL/SL						325	226	1,085	2,217	5,678	1,741	613	1,952	13,835
	11 Other Core						52	35	57	692	1,121	2,309	252	3,199	7,716
	12 East BL & OR						78	163	375	890	4,697	1,719	2,911	3,191	14,024
	13 Non-Core						305	267	1,034	3,632	12,965	20,372	1,570	23,334	63,480
Total		0	0	0	0	0	1,716	1,191	5,901	14,036	49,493	34,541	5,854	35,706	148,438

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	102	68	215	80	22	0	463	226	1,889	571	0	168	3,805
	2 Spring Hill	27	0	0	7	0	0	0	0	10	91	0	24	19	178
	3 Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4 Tysons Corner	105	41	0	0	7	0	0	68	37	256	47	0	70	630
	5 McLean	5	0	0	0	0	0	0	27	27	147	5	0	0	211
	6 Outer VA OR	51	0	0	16	0	63	43	517	360	2,087	559	21	238	3,955
	7 WFC	5	1	0	0	0	38	0	110	41	450	89	5	33	773
	8 Inner VA OR	129	17	44	101	21	171	21	273	163	2,527	480	28	220	4,194
	9 VA BL/Yellow	38	14	0	29	5	63	42	367	4,290	9,858	5,694	184	2,281	22,666
	10 Core OR/BL/SL	171	30	32	111	32	209	16	1,036	1,959	4,342	1,486	850	1,921	12,195
	11 Other Core	86	0	0	0	0	67	13	79	932	1,095	2,270	90	3,134	7,765
	12 East BL & OR	42	0	5	110	14	130	0	253	837	4,151	1,151	1,966	2,450	11,108
	13 Non-Core	153	45	37	189	28	267	17	604	3,464	10,219	17,951	931	20,600	54,506
Total		811	249	187	778	187	1,029	152	3,798	12,345	36,911	30,305	4,099	31,134	121,985

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	102	68	215	80	22	0	463	226	1,889	571	0	168	3,805
2	Spring Hill	27	0	0	7	0	0	0	0	10	91	0	24	19	178
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Tysons Corner	105	41	0	0	7	0	0	68	37	256	47	0	70	630
5	McLean	5	0	0	0	0	0	0	27	27	147	5	0	0	211
6	Outer VA OR	51	0	0	16	0	-237	-206	-354	-180	-1,378	-184	-53	-180	-2,705
7	WFC	5	1	0	0	0	-268	0	1,250	602	-4,524	1,009	-82	-476	-3,207
8	Inner VA OR	129	17	44	101	21	32	-74	12	-113	-357	68	-92	-42	-254
9	VA BL/Yellow	38	14	0	29	5	-148	-115	-490	-857	-4,050	-453	-42	-561	-6,630
10	Core OR/BL/SL	171	30	32	111	32	-116	-210	-48	-258	-1,336	-254	237	-31	-1,641
11	Other Core	86	0	0	0	0	15	-22	22	240	-26	-39	-162	-65	50
12	East BL & OR	42	0	5	110	14	52	-163	-122	-53	-546	-569	-945	-741	-2,916
13	Non-Core	153	45	37	189	28	-39	-249	-430	-168	-2,746	-2,821	-639	-2,734	-8,974
Total		811	249	187	778	187	-687	1,039	-2,103	1,691	-12,581	-4,236	-1,754	-4,572	-26,452

Trips on the project = 6,379

Table A41: Unadjusted Rail Trips by Access Mode – Park and Ride – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					47	36	966	856	10,182	2,313	59	595	15,055
	7 WFC						0	16	160	230	3,760	1,010	9	286	5,471
	8 Inner VA OR						32	0	154	100	3,527	903	41	256	5,013
	9 VA BL/Yellow						0	33	440	7,253	11,777	6,067	203	1,616	27,392
	10 Core OR/BL/SL						153	46	110	489	2,695	580	415	716	5,203
	11 Other Core						45	22	77	444	951	959	78	925	3,501
	12 East BL & OR						141	106	707	1,782	17,482	3,680	147	1,933	25,978
	13 Non-Core						78	26	1,088	4,637	24,857	35,040	170	9,430	75,327
Total		0	0	0	0	0	497	286	3,703	15,792	75,231	50,552	1,123	15,756	162,939

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	12	12	79	8	0	0	416	294	3,372	1,054	13	230	5,491
	2 Spring Hill	0	0	0	30	0	0	0	0	14	108	20	0	0	172
	3 Greensboro	0	0	0	0	0	0	0	0	10	115	27	0	6	158
	4 Tysons Corner	10	0	0	0	0	2	0	32	0	198	20	0	11	274
	5 McLean	0	0	0	0	0	0	0	20	5	365	45	0	0	434
	6 Outer VA OR	0	2	0	0	0	0	17	691	412	7,843	1,850	17	445	11,276
	7 WFC	0	0	0	0	0	7	0	89	62	1,487	373	6	33	2,057
	8 Inner VA OR	0	0	0	11	4	30	0	40	102	2,958	664	19	193	4,021
	9 VA BL/Yellow	14	6	0	27	5	28	0	169	4,950	8,747	5,592	66	1,131	20,734
	10 Core OR/BL/SL	125	6	27	98	23	262	59	228	755	1,947	470	592	1,287	5,877
	11 Other Core	14	0	0	36	14	56	25	67	495	698	1,019	160	1,744	4,327
	12 East BL & OR	39	2	10	85	9	92	0	507	1,462	13,435	2,845	81	1,032	19,600
	13 Non-Core	70	9	40	5	22	57	0	696	3,294	20,827	31,532	109	7,692	64,351
Total		272	37	88	370	85	533	101	2,954	11,855	62,100	45,511	1,063	13,804	138,772

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	12	12	79	8	0	0	416	294	3,372	1,054	13	230	5,491
2	Spring Hill	0	0	0	30	0	0	0	0	14	108	20	0	0	172
3	Greensboro	0	0	0	0	0	0	0	0	10	115	27	0	6	158
4	Tysons Corner	10	0	0	0	0	2	0	32	0	198	20	0	11	274
5	McLean	0	0	0	0	0	0	0	20	5	365	45	0	0	434
6	Outer VA OR	0	2	0	0	0	-47	-20	-276	-444	-2,339	-463	-42	-150	-3,779
7	WFC	0	0	0	0	0	7	-16	-71	-168	-2,273	-637	-4	253	-3,414
8	Inner VA OR	0	0	0	11	4	-1	0	-114	2	-569	-239	-22	-63	-992
9	VA BL/Yellow	14	6	0	27	5	28	-33	-271	-2,304	-3,031	-475	-139	-485	-6,657
10	Core OR/BL/SL	125	6	27	98	23	109	13	118	265	-748	-109	177	571	674
11	Other Core	14	0	0	36	14	10	3	-10	51	-253	59	81	820	826
12	East BL & OR	39	2	10	85	9	-49	-106	-200	-320	-4,047	-835	-65	-901	-6,379
13	Non-Core	70	9	40	5	22	-22	-26	-392	-1,343	-4,031	-3,509	-60	-1,738	-10,976
Total		272	37	88	370	85	36	-185	-748	3,938	-13,131	-5,041	-60	-1,951	-24,167

Trips on the project = 7,230

Table A42: Unadjusted Rail Trips by Access Mode – Kiss and Ride – Before Conditions

Before

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
6	Outer VA OR						22	20	232	105	1,780	335	21	214	2,729
7	WFC						27	0	19	53	633	108	9	77	927
8	Inner VA OR						69	54	141	88	1,950	434	10	158	2,903
9	VA BL/Yellow						74	75	133	1,485	3,113	1,834	83	899	7,696
10	Core OR/BL/SL	*No Trips in Before Conditions*					55	62	320	304	1,529	384	72	467	3,192
11	Other Core						12	19	33	50	344	466	0	468	1,371
12	East BL & OR						58	35	157	375	2,781	600	168	895	5,069
13	Non-Core						156	74	323	1,128	5,248	7,573	291	4,557	19,350
	Total	0	0	0	0	0	472	338	1,337	3,588	17,377	11,734	655	7,736	43,237

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	35	0	20	0	5	0	136	118	649	209	0	100	1,272
2	Spring Hill	0	0	0	0	0	2	0	14	0	79	34	0	11	140
3	Greensboro	0	0	0	0	0	0	0	29	0	157	33	0	6	225
4	Tysons Corner	10	0	0	0	7	0	0	10	4	72	17	0	0	120
5	McLean	14	0	0	0	0	0	0	4	21	154	114	0	17	323
6	Outer VA OR	14	0	0	0	0	11	0	146	126	1,416	305	10	129	2,157
7	WFC	0	0	0	0	0	0	0	23	36	319	56	0	14	448
8	Inner VA OR	86	43	10	11	0	55	0	39	50	1,277	302	35	185	2,094
9	VA BL/Yellow	25	8	0	0	0	40	0	67	1,083	2,577	1,584	79	544	6,007
10	Core OR/BL/SL	30	6	10	40	9	50	0	137	251	1,161	376	114	562	2,747
11	Other Core	0	0	7	44	0	0	0	17	214	154	385	22	750	1,593
12	East BL & OR	20	0	1	37	4	53	13	183	266	1,964	507	203	788	4,039
13	Non-Core	51	26	20	71	17	83	6	329	870	3,824	6,990	271	4,116	16,673
	Total	249	118	48	223	37	300	19	1,133	3,039	13,804	10,913	733	7,222	37,839

Change

Production Station-Group		Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Wiehle	0	35	0	20	0	5	0	136	118	649	209	0	100	1,272
2	Spring Hill	0	0	0	0	0	2	0	14	0	79	34	0	11	140
3	Greensboro	0	0	0	0	0	0	0	29	0	157	33	0	6	225
4	Tysons Corner	10	0	0	0	7	0	0	10	4	72	17	0	0	120
5	McLean	14	0	0	0	0	0	0	4	21	154	114	0	17	323
6	Outer VA OR	14	0	0	0	0	-11	-20	-86	20	-364	-30	-11	-85	-572
7	WFC	0	0	0	0	0	-27	0	4	-17	-314	-53	-9	-63	-479
8	Inner VA OR	86	43	10	11	0	-14	-54	-102	-38	-673	-131	25	27	-809
9	VA BL/Yellow	25	8	0	0	0	-33	-75	-66	-402	-535	-251	-4	-355	-1,689
10	Core OR/BL/SL	30	6	10	40	9	-4	-62	-182	-52	-368	-9	41	95	-445
11	Other Core	0	0	7	44	0	-12	-19	-4	164	-189	-81	22	282	223
12	East BL & OR	20	0	1	37	4	-5	-22	26	-109	-817	-93	34	-107	-1,030
13	Non-Core	51	26	20	71	17	-72	-68	7	-258	-2,925	-582	-71	-441	-2,676
	Total	249	118	48	223	37	-172	-319	-204	-549	-3,573	-820	78	-514	-5,398

Trips on the project = 2,670

Table A43: Unadjusted Rail Trips by Access Mode – Other – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					27	31	151	124	619	188	12	183	1,334
	7 WFC						10	49	90	81	422	74	16	92	833
	8 Inner VA OR						72	60	135	109	905	160	9	216	1,665
	9 VA BL/Yellow						96	52	500	3,176	5,009	1,924	96	1,065	11,917
	10 Core OR/BL/SL						88	137	292	540	1,968	1,369	232	574	5,199
	11 Other Core						251	52	396	1,623	6,084	7,453	0	3,412	19,281
	12 East BL & OR						53	43	65	143	763	183	151	243	1,645
	13 Non-Core						63	5	138	634	1,937	3,436	203	4,652	11,068
Total		0	0	0	0	0	660	428	1,767	6,429	17,716	14,786	719	10,438	52,943

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	0	21	10	5	32	9	69	45	429	68	32	26	789
	2 Spring Hill	4	9	9	18	7	19	2	69	18	82	94	7	44	381
	3 Greensboro	19	7	11	31	9	16	0	65	24	29	21	11	6	247
	4 Tysons Corner	21	23	26	25	39	16	4	17	28	5	29	4	25	262
	5 McLean	21	21	14	24	13	5	1	18	19	82	0	4	9	230
	6 Outer VA OR	20	10	16	34	10	64	43	113	145	599	165	23	122	1,360
	7 WFC	11	4	0	9	1	20	17	46	21	286	50	12	14	490
	8 Inner VA OR	40	40	20	58	15	52	23	39	96	862	186	14	119	1,564
	9 VA BL/Yellow	34	17	29	71	8	49	43	219	2,740	4,395	2,076	39	1,054	10,774
	10 Core OR/BL/SL	104	0	14	74	42	107	45	360	884	2,252	1,525	243	521	6,171
	11 Other Core	75	29	0	24	3	105	21	341	1,618	4,989	7,536	59	3,084	17,884
	12 East BL & OR	0	3	35	17	12	41	30	36	125	716	174	60	277	1,526
	13 Non-Core	52	60	11	57	0	74	22	168	928	2,324	4,438	72	4,947	13,154
Total		443	220	205	451	164	598	259	1,561	6,692	17,050	16,361	581	10,248	54,834

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	0	21	10	5	32	9	69	45	429	68	32	26	789
	2 Spring Hill	4	9	9	18	7	19	2	69	18	82	94	7	44	381
	3 Greensboro	19	7	11	31	9	16	0	65	24	29	21	11	6	247
	4 Tysons Corner	21	23	26	25	39	16	4	17	28	5	29	4	25	262
	5 McLean	21	21	14	24	13	5	1	18	19	82	0	4	9	230
	6 Outer VA OR	20	10	16	34	10	36	11	-38	21	-20	-22	11	-61	26
	7 WFC	11	4	0	9	1	11	-32	-45	-59	136	-24	-4	-78	-343
	8 Inner VA OR	40	40	20	58	15	-20	-37	-95	-13	-43	26	5	-97	-101
	9 VA BL/Yellow	34	17	29	71	8	-47	-9	-281	-436	-613	152	-56	-11	-1,143
	10 Core OR/BL/SL	104	0	14	74	42	19	-92	68	344	284	156	12	-53	972
	11 Other Core	75	29	0	24	3	-146	-31	-55	-5	-1,105	83	59	-328	-1,397
	12 East BL & OR	0	3	35	17	12	-13	-12	-29	-18	-47	-9	-91	34	-118
	13 Non-Core	52	60	11	57	0	12	17	30	294	387	1,001	-131	296	2,085
Total		443	220	205	451	164	-62	-169	-206	263	-666	1,574	-137	-190	1,891

Trips on the project = 2,966

Table A44: Unadjusted Rail Trips by Income – All Incomes – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					482	474	2,614	1,815	17,213	3,788	187	1,561	28,134
	7 WFC						345	16	1,733	1,065	9,614	2,248	105	1,013	16,138
	8 Inner VA OR						934	662	2,403	2,373	24,835	4,848	292	2,541	38,887
	9 VA BL/Yellow						561	406	2,859	22,896	47,358	23,140	634	8,860	106,715
	10 Core OR/BL/SL						1,700	1,064	5,589	9,694	40,461	12,327	2,938	11,193	84,966
	11 Other Core						749	384	1,704	7,153	21,233	30,276	764	26,410	88,671
	12 East BL & OR						286	390	1,325	3,501	26,555	6,655	4,080	7,893	50,685
	13 Non-Core						1,011	824	4,247	15,685	67,801	113,494	3,546	78,078	284,686
Total		0	0	0	0	0	6,067	4,220	22,474	64,181	255,070	196,776	12,546	137,550	698,884

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	137	97	340	106	49	0	1,044	691	5,843	1,613	28	551	10,520
	2 Spring Hill	27	0	0	47	10	14	0	54	42	573	44	24	50	885
	3 Greensboro	6	0	0	21	7	0	0	53	36	437	62	0	31	654
	4 Tysons Corner	135	51	0	0	27	4	0	260	151	889	201	5	192	1,913
	5 McLean	44	5	7	38	0	4	0	105	94	1,014	207	0	56	1,575
	6 Outer VA OR	81	8	10	63	32	307	96	1,734	1,265	14,006	3,157	95	1,137	21,990
	7 WFC	5	1	0	4	0	91	0	262	139	3,028	592	17	214	4,352
	8 Inner VA OR	587	169	306	789	241	750	62	1,994	1,570	22,571	3,850	109	2,247	35,246
	9 VA BL/Yellow	162	88	35	181	65	208	54	1,540	18,167	38,345	21,862	523	7,525	88,755
	10 Core OR/BL/SL	706	204	286	975	271	1,035	143	4,636	7,982	34,025	9,624	2,150	7,916	69,955
	11 Other Core	293	30	78	234	71	332	76	1,391	7,040	16,915	26,908	627	20,190	74,187
	12 East BL & OR	178	48	50	287	43	356	13	1,109	3,180	22,204	5,319	2,850	5,977	41,614
	13 Non-Core	476	127	205	593	231	796	51	3,324	14,306	58,581	106,199	2,086	67,687	254,662
Total		2,720	868	1,074	3,572	1,106	3,946	496	17,506	54,663	218,431	179,637	8,514	113,773	606,307

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	137	97	340	106	49	0	1,044	691	5,843	1,613	28	551	10,520
	2 Spring Hill	27	0	0	47	10	14	0	54	42	573	44	24	50	885
	3 Greensboro	6	0	0	21	7	0	0	53	36	437	62	0	31	654
	4 Tysons Corner	135	51	0	0	27	4	0	260	151	889	201	5	192	1,913
	5 McLean	44	5	7	38	0	4	0	105	94	1,014	207	0	56	1,575
	6 Outer VA OR	81	8	10	63	32	-175	-379	-880	-550	-4,207	-631	-92	-424	-6,144
	7 WFC	5	1	0	4	0	-253	-16	1,471	926	-6,586	1,855	-89	799	-11,786
	8 Inner VA OR	587	169	306	789	241	-184	-599	-409	-803	-2,264	-998	-182	-294	-3,641
	9 VA BL/Yellow	162	88	35	181	65	-354	-352	-1,318	-4,729	-9,015	-1,279	-111	-1,336	-17,961
	10 Core OR/BL/SL	706	204	286	975	271	-665	-921	-953	1,712	-6,438	-2,703	-788	3,277	-15,012
	11 Other Core	293	30	78	234	71	-417	-308	-313	-113	-4,918	8,388	-137	-6,220	-14,484
	12 East BL & OR	178	48	50	287	43	70	-377	-216	-320	-4,350	1,336	-1,230	1,917	-9,071
	13 Non-Core	476	127	205	593	231	-215	-773	-923	-1,379	-9,220	-7,295	-1,460	10,391	-10,024
Total		2,720	868	1,074	3,572	1,106	-2,121	-3,725	-4,968	-5,517	-36,638	-17,139	-4,032	-23,777	-92,576

Trips on the project = 23,761

Table A45: Unadjusted Rail Trips by Income – <$50k

Production Station-Group		Before	Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	6	Outer VA OR						161	177	547	76	1,746	386	33	367	3,494
	7	WFC						195	16	277	38	809	245	9	256	1,845
	8	Inner VA OR						291	103	599	421	3,667	676	118	529	6,403
	9	VA BL/Yellow						215	131	558	3,644	7,467	3,321	188	2,392	17,916
	10	Core OR/BL/SL	*No Trips in Before Conditions*					364	195	1,347	1,898	8,087	2,391	1,115	3,451	18,846
	11	Other Core						175	81	300	1,239	3,475	5,515	352	7,796	18,924
	12	East BL & OR						90	203	389	991	5,710	2,031	2,969	4,152	16,535
	13	Non-Core						392	263	1,289	4,124	11,842	23,367	2,281	30,147	73,705
		Total	0	0	0	0	0	1,884	1,169	5,306	12,431	42,801	37,929	7,065	49,084	157,669

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

Production Station-Group		After	Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	21	35	12	76	12	37	0	65	39	476	176	7	77	1,033
	2	Spring Hill	0	0	0	0	0	6	0	11	8	42	10	24	21	122
	3	Greensboro	0	0	0	0	0	0	0	0	0	59	0	0	0	59
	4	Tysons Corner	53	16	0	0	0	2	0	15	71	134	20	5	101	417
	5	McLean	6	0	7	23	0	4	0	70	5	100	5	0	0	220
	6	Outer VA OR	51	0	0	31	9	135	42	203	126	1,147	261	17	183	2,203
	7	WFC	0	0	0	0	0	39	0	35	10	254	6	5	81	430
	8	Inner VA OR	111	31	48	122	6	214	33	363	276	2,939	337	40	334	4,853
	9	VA BL/Yellow	43	37	0	45	11	87	20	275	2,940	5,238	2,288	310	1,593	12,887
	10	Core OR/BL/SL	123	82	12	174	29	240	27	762	1,533	5,460	1,835	971	2,225	13,474
	11	Other Core	17	10	8	56	0	29	44	299	1,107	2,164	3,912	223	5,403	13,272
	12	East BL & OR	77	46	40	153	13	169	0	351	1,186	4,782	1,363	2,205	3,147	13,533
	13	Non-Core	148	55	26	281	90	313	46	773	3,353	9,380	18,177	1,313	24,155	58,113
		Total	650	312	152	963	170	1,275	212	3,223	10,653	32,176	28,392	5,118	37,321	120,616

Production Station-Group		Change	Attraction Station-Group 1	2	3	4	5	6	7	8	9	10	11	12	13	Total
	1	Wiehle	21	35	12	76	12	37	0	65	39	476	176	7	77	1,033
	2	Spring Hill	0	0	0	0	0	6	0	11	8	42	10	24	21	122
	3	Greensboro	0	0	0	0	0	0	0	0	0	59	0	0	0	59
	4	Tysons Corner	53	16	0	0	0	2	0	15	71	134	20	5	101	417
	5	McLean	6	0	7	23	0	4	0	70	5	100	5	0	0	220
	6	Outer VA OR	51	0	0	31	9	-27	-136	-345	50	-599	-125	-16	-185	-1,291
	7	WFC	0	0	0	0	0	-156	-16	-242	-28	-555	-238	-4	-175	-1,415
	8	Inner VA OR	111	31	48	122	6	-77	-70	-236	-145	-728	-339	-78	-195	-1,551
	9	VA BL/Yellow	43	37	0	45	11	-127	-111	-283	-704	-2,229	-1,032	-121	-799	-5,028
	10	Core OR/BL/SL	123	82	12	174	29	-124	-167	-585	-365	-2,627	-556	-144	-1,225	-5,373
	11	Other Core	17	10	8	56	0	-146	-36	-1	-132	-1,331	-1,601	-129	-2,387	-5,652
	12	East BL & OR	77	46	40	153	13	79	-203	-38	194	-928	-668	-764	-1,005	3,003
	13	Non-Core	148	55	26	281	90	-79	-217	-516	-771	-2,462	-5,190	-968	-5,992	-15,583
		Total	650	312	152	963	170	-609	-957	-2,084	-1,778	-10,625	-8,537	-1,947	-12,763	-37,053

Trips on the project = 3,838

Table A46: Unadjusted Rail Trips by Income – $50k-$75k – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					86	88	429	281	1,941	423	35	206	3,489
	7 WFC						17	0	170	62	998	296	14	177	1,734
	8 Inner VA OR						239	164	455	375	3,993	594	27	469	6,315
	9 VA BL/Yellow						65	55	503	2,806	7,797	3,877	105	1,474	16,684
	10 Core OR/BL/SL						453	169	1,112	1,822	6,871	2,061	621	1,883	14,993
	11 Other Core						192	100	434	1,310	5,345	5,831	172	4,942	16,326
	12 East BL & OR						39	59	274	607	5,542	1,434	466	1,530	9,950
	13 Non-Core						172	216	643	2,978	10,834	19,661	512	14,832	49,848
Total		0	0	0	0	0	1,262	851	4,022	10,241	41,322	34,177	1,953	25,513	119,340

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	8	0	70	8	7	0	158	134	462	62	0	61	971
	2 Spring Hill	0	0	0	7	0	2	0	0	10	38	0	0	11	68
	3 Greensboro	0	0	0	21	0	0	0	33	0	70	4	0	4	131
	4 Tysons Corner	69	0	0	0	0	0	0	107	39	199	37	0	11	463
	5 McLean	0	0	0	15	0	0	0	0	48	71	0	0	36	169
	6 Outer VA OR	0	0	0	2	0	49	0	169	99	1,627	451	10	115	2,523
	7 WFC	0	1	0	4	0	10	0	44	0	400	90	0	19	568
	8 Inner VA OR	128	11	57	138	17	133	16	356	262	2,779	691	17	376	4,982
	9 VA BL/Yellow	71	0	0	62	16	22	18	242	2,144	5,345	2,815	82	1,207	12,023
	10 Core OR/BL/SL	116	58	104	126	17	240	25	895	1,173	5,705	1,307	301	1,386	11,451
	11 Other Core	99	0	22	20	16	77	6	217	1,135	2,751	4,147	133	3,608	12,230
	12 East BL & OR	44	0	0	44	9	37	13	269	651	4,334	990	393	1,184	7,968
	13 Non-Core	74	18	85	136	57	139	0	702	2,458	8,613	16,831	350	12,156	41,619
Total		600	95	267	645	140	716	78	3,191	8,153	32,393	27,425	1,287	20,174	95,165

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	8	0	70	8	7	0	158	134	462	62	0	61	971
	2 Spring Hill	0	0	0	7	0	2	0	0	10	38	0	0	11	68
	3 Greensboro	0	0	0	21	0	0	0	33	0	70	4	0	4	131
	4 Tysons Corner	69	0	0	0	0	0	0	107	39	199	37	0	11	463
	5 McLean	0	0	0	15	0	0	0	0	48	71	0	0	36	169
	6 Outer VA OR	0	0	0	2	0	-36	-88	-260	-183	-314	28	-25	-90	-966
	7 WFC	0	1	0	4	0	-7	0	-126	-62	-598	-206	-14	-158	-1,166
	8 Inner VA OR	128	11	57	138	17	-105	-148	-99	-112	1,214	97	-9	-93	1,333
	9 VA BL/Yellow	71	0	0	62	16	-44	-37	-261	-662	-2,455	-3,062	-23	-268	-8,662
	10 Core OR/BL/SL	116	58	104	126	17	-213	-144	-218	-649	1,166	-755	-320	-498	-3,543
	11 Other Core	99	0	22	20	16	-116	-94	-217	-174	-594	-1,684	-40	-1,334	-4,096
	12 East BL & OR	44	0	0	44	9	-2	-46	-5	45	1,108	-444	-73	-346	1,982
	13 Non-Core	74	18	85	136	57	-32	-216	58	-520	-2,221	-2,880	-162	-2,675	-8,229
Total		600	95	267	645	140	-546	-773	-830	-2,088	-8,929	-6,751	-666	-5,339	-24,175

Trips on the project = 3,352

Table A47: Unadjusted Rail Trips by Income – $75k-$100k – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					123	28	463	276	2,482	575	53	186	4,185
	7 WFC						63	0	284	197	1,476	236	22	208	2,486
	8 Inner VA OR						67	108	401	293	3,224	647	61	438	5,240
	9 VA BL/Yellow						69	118	489	4,020	7,711	3,787	91	1,443	17,728
	10 Core OR/BL/SL						159	190	828	1,786	5,606	1,736	339	1,716	12,360
	11 Other Core						144	47	259	1,019	3,774	4,675	82	3,907	13,907
	12 East BL & OR						97	49	235	568	4,768	1,015	255	722	7,711
	13 Non-Core						209	103	588	2,428	10,412	17,029	271	10,837	41,877
Total		0	0	0	0	0	930	642	3,548	10,587	39,453	29,701	1,176	19,457	105,494

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	0	50	13	0	0	185	80	761	117	0	144	1,351
	2 Spring Hill	0	0	0	0	0	0	0	7	10	124	10	0	8	159
	3 Greensboro	0	0	0	0	0	0	0	0	10	53	4	0	0	67
	4 Tysons Corner	13	0	0	0	14	0	0	58	4	90	25	0	30	234
	5 McLean	9	0	0	0	0	0	0	22	0	132	45	0	3	211
	6 Outer VA OR	4	6	10	28	0	47	21	307	83	1,904	304	27	155	2,895
	7 WFC	0	0	0	0	0	18	0	23	32	270	81	0	26	450
	8 Inner VA OR	121	41	38	170	67	110	14	374	220	3,045	527	13	322	5,060
	9 VA BL/Yellow	21	22	0	8	11	18	0	225	2,872	5,934	3,620	57	1,326	14,114
	10 Core OR/BL/SL	114	0	38	185	66	197	8	702	1,505	4,963	1,321	366	1,178	10,644
	11 Other Core	35	21	4	12	21	58	0	186	1,115	3,830	4,534	101	3,066	11,984
	12 East BL & OR	16	0	0	18	12	74	0	171	347	3,920	896	167	613	6,233
	13 Non-Core	51	46	34	36	44	88	6	521	2,234	9,021	16,529	158	9,043	37,810
Total		384	134	124	509	248	610	48	2,780	8,512	33,047	28,014	889	15,916	91,213

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	0	0	50	13	0	0	185	80	761	117	0	144	1,351
	2 Spring Hill	0	0	0	0	0	0	0	7	10	124	10	0	8	159
	3 Greensboro	0	0	0	0	0	0	0	0	10	53	4	0	0	67
	4 Tysons Corner	13	0	0	0	14	0	0	58	4	90	25	0	30	234
	5 McLean	9	0	0	0	0	0	0	22	0	132	45	0	3	211
	6 Outer VA OR	4	6	10	28	0	-77	-7	-156	-192	-578	-270	-26	-31	-1,290
	7 WFC	0	0	0	0	0	-44	0	-260	-165	1,206	-156	-22	-182	-2,036
	8 Inner VA OR	121	41	38	170	67	43	-94	-27	-73	-180	-120	-49	-116	-180
	9 VA BL/Yellow	21	22	0	8	11	-51	-118	-264	-1,149	-1,778	-168	-34	-117	-3,613
	10 Core OR/BL/SL	114	0	38	185	66	38	-182	-126	-281	-643	-414	27	-538	-1,716
	11 Other Core	35	21	4	12	21	-86	-47	-73	96	-945	-141	19	-840	-1,923
	12 East BL & OR	16	0	0	18	12	-23	-49	-65	-221	-848	-120	-89	-110	-1,478
	13 Non-Core	51	46	34	36	44	-121	-97	-67	-194	-1,390	-500	-113	-1,794	-4,067
Total		384	134	124	509	248	-320	-594	-768	-2,075	-6,406	-1,688	-288	-3,541	-16,281

Trips on the project = 3,322

Table A48: Unadjusted Rail Trips by Income – >$100k – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR						112	182	1,175	1,182	11,044	2,405	65	802	16,966
	7 WFC						70	0	1,002	767	6,331	1,471	60	373	10,074
	8 Inner VA OR						337	287	947	1,284	13,951	2,932	86	1,105	20,929
	9 VA BL/Yellow						213	102	1,308	12,425	24,383	12,155	250	3,551	54,388
	10 Core OR/BL/SL	*No Trips in Before Conditions*					724	510	2,301	4,188	19,897	6,139	863	4,143	38,767
	11 Other Core						238	156	711	3,585	10,638	14,257	157	9,771	39,514
	12 East BL & OR						60	79	427	1,334	10,535	2,175	389	1,489	16,488
	13 Non-Core						238	242	1,726	6,155	34,713	53,437	482	22,262	119,256
Total		0	0	0	0	0	1,991	1,558	9,598	30,922	131,494	94,969	2,352	43,497	316,381

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	94	85	144	73	5	0	636	437	4,143	1,257	22	269	7,166
	2 Spring Hill	27	0	0	39	10	6	0	36	14	368	24	0	11	535
	3 Greensboro	6	0	0	0	7	0	0	20	26	255	54	0	27	396
	4 Tysons Corner	0	35	0	0	14	2	0	80	36	465	118	0	49	800
	5 McLean	29	5	0	0	0	0	0	13	42	712	157	0	17	974
	6 Outer VA OR	27	2	0	2	24	77	34	1,055	957	9,328	2,140	41	683	14,369
	7 WFC	5	0	0	0	0	24	0	159	87	2,104	415	12	89	2,904
	8 Inner VA OR	227	86	164	358	151	293	0	901	813	13,808	2,295	40	1,215	20,351
	9 VA BL/Yellow	28	29	35	66	27	81	16	798	10,212	21,828	13,138	74	3,399	49,730
	10 Core OR/BL/SL	352	64	132	490	159	359	83	2,278	3,772	17,898	5,161	512	3,126	34,388
	11 Other Core	142	0	45	146	34	168	25	689	3,683	9,171	14,315	170	8,112	36,701
	12 East BL & OR	42	2	10	71	9	76	0	318	996	9,169	2,070	85	1,033	13,880
	13 Non-Core	202	9	60	139	40	255	0	1,329	6,261	31,567	54,661	264	22,333	117,120
Total		1,086	327	531	1,455	548	1,346	158	8,312	27,346	120,815	95,806	1,220	40,362	299,313

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	94	85	144	73	5	0	636	437	4,143	1,257	22	269	7,166
	2 Spring Hill	27	0	0	39	10	6	0	36	14	368	24	0	11	535
	3 Greensboro	6	0	0	0	7	0	0	20	26	255	54	0	27	396
	4 Tysons Corner	0	35	0	0	14	2	0	80	36	465	118	0	49	800
	5 McLean	29	5	0	0	0	0	0	13	42	712	157	0	17	974
	6 Outer VA OR	27	2	0	2	24	-35	-148	-120	-225	-1,716	-264	-24	-119	-2,597
	7 WFC	5	0	0	0	0	-46	0	-843	-670	-4,227	-1,056	-48	-284	-7,169
	8 Inner VA OR	227	86	164	358	151	-43	-287	-47	-472	-143	-637	-46	110	-578
	9 VA BL/Yellow	28	29	35	66	27	-132	-86	-510	-2,214	-2,555	983	176	-152	-4,657
	10 Core OR/BL/SL	352	64	132	490	159	-365	-427	-23	-416	-2,000	-978	-351	-1,017	-4,381
	11 Other Core	142	0	45	146	34	-70	-131	-22	98	-1,468	59	13	-1,359	-2,813
	12 East BL & OR	42	2	10	71	9	16	-79	-109	-338	-1,386	-105	-303	-456	-2,608
	13 Non-Core	202	9	60	139	40	17	-242	-397	106	-3,147	1,224	-218	71	-2,136
Total		1,086	327	531	1,455	548	-646	-1,400	-1,286	-3,576	-10,678	837	-1,132	-3,135	-17,068

Trips on the project = 13,250

Table A49: Unadjusted Rail Trips by Vehicles Owned – All Levels of Ownership – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR						482	474	2,785	1,975	18,683	4,097	197	1,670	30,364
	7 WFC						346	16	1,827	1,152	10,272	2,444	116	994	17,167
	8 Inner VA OR						987	694	2,502	2,502	26,250	5,237	265	2,674	41,111
	9 VA BL/Yellow						613	406	3,006	23,950	50,093	24,160	655	9,288	112,171
	10 Core OR/BL/SL	*No Trips in Before Conditions*					1,796	1,111	5,742	10,142	42,171	12,849	2,835	11,626	88,273
	11 Other Core						778	420	1,746	7,582	22,202	31,297	822	27,237	92,084
	12 East BL & OR						341	396	1,378	3,664	27,494	7,047	4,238	8,068	52,627
	13 Non-Core						1,056	883	4,457	16,456	71,765	119,005	3,610	81,232	298,465
Total		0	0	0	0	0	6,400	4,402	23,444	67,423	268,930	206,135	12,739	142,790	732,261

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	176	97	363	106	49	0	1,180	743	6,739	2,011	44	646	12,174
	2 Spring Hill	52	0	0	47	10	12	0	54	56	623	64	24	50	993
	3 Greensboro	6	0	0	21	7	0	0	57	46	537	85	0	31	790
	4 Tysons Corner	154	51	0	0	27	4	0	276	151	990	206	5	192	2,056
	5 McLean	52	5	7	38	0	4	0	112	99	1,182	242	0	56	1,797
	6 Outer VA OR	81	8	10	77	32	319	110	2,010	1,460	15,458	3,587	95	1,272	24,519
	7 WFC	5	1	0	4	0	95	0	291	159	3,327	672	17	241	4,811
	8 Inner VA OR	669	188	357	918	262	769	69	2,125	1,746	25,253	4,444	106	2,459	39,364
	9 VA BL/Yellow	162	88	68	197	65	253	54	1,672	20,259	42,528	24,508	525	8,284	98,663
	10 Core OR/BL/SL	786	245	305	982	292	1,102	149	5,110	8,823	37,244	10,614	2,273	8,484	76,408
	11 Other Core	293	30	97	246	71	339	76	1,543	7,711	18,741	29,553	680	22,044	81,427
	12 East BL & OR	178	48	51	287	43	368	13	1,193	3,347	24,034	5,740	2,971	6,175	44,448
	13 Non-Core	531	138	222	660	238	880	51	3,531	15,446	63,748	115,380	2,164	71,920	274,868
Total		2,990	977	1,213	3,840	1,154	4,153	523	19,155	60,046	240,404	197,105	8,904	121,854	662,319

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	176	97	363	106	49	0	1,180	743	6,739	2,011	44	646	12,174
	2 Spring Hill	52	0	0	47	10	12	0	54	56	623	64	24	50	993
	3 Greensboro	6	0	0	21	7	0	0	57	46	537	85	0	31	790
	4 Tysons Corner	154	51	0	0	27	4	0	276	151	990	206	5	192	2,056
	5 McLean	52	5	7	38	0	4	0	112	99	1,182	242	0	56	1,797
	6 Outer VA OR	81	8	10	77	32	-163	-364	-776	-515	-3,225	-509	-102	-399	-5,845
	7 WFC	5	1	0	4	0	-251	-16	-1,536	-893	-6,944	-1,772	-100	-753	-12,316
	8 Inner VA OR	669	188	357	918	262	-218	-625	-378	-756	-997	-793	-159	-215	-1,747
	9 VA BL/Yellow	162	88	68	197	65	-360	-352	-1,335	-5,693	-7,565	348	-129	-2,004	-13,507
	10 Core OR/BL/SL	786	245	305	982	292	-695	-962	-632	-1,319	-4,927	-2,235	-562	-3,143	-11,865
	11 Other Core	293	30	97	246	71	-438	-344	-203	129	-3,461	-1,743	-141	-5,194	-10,657
	12 East BL & OR	178	48	51	287	43	27	-383	-185	-317	-3,460	-1,307	-1,267	-1,893	8,179
	13 Non-Core	531	138	222	660	238	-217	-832	-925	-1,010	-8,017	-3,623	-2,467	-9,317	-23,597
Total		2,990	977	1,213	3,840	1,154	-2,247	-4,879	-4,289	-7,376	-28,526	-9,030	-3,834	-20,937	-69,943

Trips on the project = 26,743

Table A50: Unadjusted Rail Trips by Vehicles Owned – 0 Vehicles – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					119	151	231	121	634	142	34	184	1,617
	7 WFC						130	0	92	29	349	83	18	52	754
	8 Inner VA OR						377	327	606	583	3,513	630	58	541	6,635
	9 VA BL/Yellow						211	131	681	3,044	6,489	3,042	142	1,514	15,253
	10 Core OR/BL/SL						462	481	2,160	2,892	11,207	3,341	887	3,771	25,201
	11 Other Core						251	164	605	2,199	6,264	9,249	305	11,443	30,479
	12 East BL & OR						112	154	205	764	3,337	1,216	2,373	2,845	11,005
	13 Non-Core						346	389	1,142	4,133	11,894	22,591	1,736	29,182	71,412
Total		0	0	0	0	0	2,008	1,797	5,723	13,766	43,686	40,294	5,553	49,530	162,357

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	32	12	85	9	7	0	68	46	211	22	7	68	566
	2 Spring Hill	12	0	0	0	0	0	0	7	8	102	0	24	32	185
	3 Greensboro	0	0	0	12	0	0	0	0	0	86	0	0	11	109
	4 Tysons Corner	68	51	0	0	14	0	0	72	75	98	6	5	116	506
	5 McLean	5	0	3	15	0	0	0	49	11	59	5	0	16	162
	6 Outer VA OR	67	0	0	31	9	151	42	177	101	678	154	17	139	1,564
	7 WFC	0	1	0	4	0	10	0	27	5	166	14	0	41	267
	8 Inner VA OR	221	41	138	474	80	239	35	808	580	4,340	593	31	492	8,071
	9 VA BL/Yellow	64	14	0	64	54	42	0	337	3,210	5,956	3,029	197	1,784	14,752
	10 Core OR/BL/SL	204	54	136	474	160	435	37	2,257	2,718	11,875	2,515	886	2,646	24,398
	11 Other Core	72	10	56	106	41	121	44	586	2,569	5,483	9,203	224	9,303	27,817
	12 East BL & OR	44	46	5	57	16	141	0	275	799	2,987	843	1,626	2,283	9,122
	13 Non-Core	178	75	78	357	159	318	6	1,103	4,811	11,528	23,593	1,113	25,483	68,802
Total		937	323	428	1,680	541	1,463	163	5,765	14,933	43,569	39,976	4,128	42,413	156,320

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	32	12	85	9	7	0	68	46	211	22	7	68	566
	2 Spring Hill	12	0	0	0	0	0	0	7	8	102	0	24	32	185
	3 Greensboro	0	0	0	12	0	0	0	0	0	86	0	0	11	109
	4 Tysons Corner	68	51	0	0	14	0	0	72	75	98	6	5	116	506
	5 McLean	5	0	3	15	0	0	0	49	11	59	5	0	16	162
	6 Outer VA OR	67	0	0	31	9	32	-109	-55	-20	43	12	-17	-44	-52
	7 WFC	0	1	0	4	0	-120	0	-65	-24	-183	-70	-18	-11	-487
	8 Inner VA OR	221	41	138	474	80	-138	-292	202	-4	827	-37	-27	-49	1,435
	9 VA BL/Yellow	64	14	0	64	54	-169	-131	-345	166	-533	-13	55	271	-501
	10 Core OR/BL/SL	204	54	136	474	160	-28	-444	97	-174	668	-827	0	-1,125	-803
	11 Other Core	72	10	56	106	41	-131	-120	-19	369	-781	-46	-81	-2,189	-2,662
	12 East BL & OR	44	46	5	57	16	29	-154	69	35	-350	-373	-747	-562	-1,884
	13 Non-Core	178	75	78	357	159	-28	-384	-39	678	-366	1,002	-623	-3,699	-2,610
Total		937	323	428	1,680	541	-545	-1,634	42	1,187	-117	-318	-1,424	-7,116	-6,036

Trips on the project = 5,120

Table A51: Unadjusted Rail Trips by Vehicles Owned – 1 Vehicle – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					180	127	839	606	5,833	1,094	45	516	9,239
	7 WFC						92	0	666	370	2,918	823	52	468	5,389
	8 Inner VA OR						369	262	1,121	1,159	12,791	2,313	127	1,371	19,513
	9 VA BL/Yellow						266	218	1,234	8,837	23,063	10,957	234	4,316	49,126
	10 Core OR/BL/SL						579	356	2,281	4,000	19,053	5,221	887	4,364	36,740
	11 Other Core						188	181	644	2,845	8,334	12,222	216	9,677	34,308
	12 East BL & OR						94	110	458	1,067	9,333	2,109	1,079	2,465	16,716
	13 Non-Core						367	283	1,797	5,788	27,695	48,008	1,078	30,559	115,575
	Total	0	0	0	0	0	2,136	1,538	9,041	24,673	109,020	82,748	3,717	53,735	286,607

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	28	60	107	50	11	0	389	177	1,657	450	16	175	3,119
	2 Spring Hill	0	0	0	17	5	6	0	34	24	165	50	0	11	312
	3 Greensboro	6	0	0	10	7	0	0	44	0	123	48	0	6	243
	4 Tysons Corner	86	0	0	0	7	2	0	132	35	415	89	0	38	804
	5 McLean	22	5	0	23	0	4	0	43	20	369	77	0	7	570
	6 Outer VA OR	14	0	10	16	24	114	22	662	395	4,762	1,240	10	521	7,790
	7 WFC	5	0	0	0	0	39	0	114	62	1,067	195	5	99	1,586
	8 Inner VA OR	312	55	145	292	133	326	14	867	749	12,053	2,016	30	1,131	18,123
	9 VA BL/Yellow	45	57	33	77	5	134	18	811	7,407	19,982	11,376	172	3,469	43,587
	10 Core OR/BL/SL	240	97	131	304	65	213	47	1,817	3,174	15,916	4,374	661	2,963	30,002
	11 Other Core	120	21	26	60	11	101	6	551	2,669	6,950	11,238	232	7,801	29,785
	12 East BL & OR	68	0	36	143	14	109	13	309	1,033	8,050	1,858	805	2,001	14,439
	13 Non-Core	307	28	81	230	73	315	28	1,364	5,239	24,542	46,105	476	26,777	105,561
	Total	1,225	292	521	1,280	393	1,373	149	7,136	20,984	96,051	79,117	2,407	44,994	255,921

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	0	28	60	107	50	11	0	389	177	1,657	450	16	175	3,119
	2 Spring Hill	0	0	0	17	5	6	0	34	24	165	50	0	11	312
	3 Greensboro	6	0	0	10	7	0	0	44	0	123	48	0	6	243
	4 Tysons Corner	86	0	0	0	7	2	0	132	35	415	89	0	38	804
	5 McLean	22	5	0	23	0	4	0	43	20	369	77	0	7	570
	6 Outer VA OR	14	0	10	16	24	-66	-105	-177	-211	-1,071	146	-35	5	-1,449
	7 WFC	5	0	0	0	0	-53	0	-552	-308	-1,851	-628	-47	-369	-3,803
	8 Inner VA OR	312	55	145	292	133	-43	-248	-255	-410	-738	-298	-97	-239	-1,391
	9 VA BL/Yellow	45	57	33	77	5	-133	-200	-424	-1,430	-3,081	418	-63	-847	-5,540
	10 Core OR/BL/SL	240	97	131	304	65	-366	-309	-464	-827	-3,133	-847	-225	-1,400	-6,738
	11 Other Core	120	21	26	60	11	87	175	-93	176	-1,384	-985	16	-1,875	-4,523
	12 East BL & OR	68	0	36	143	14	14	-97	-149	-34	-1,283	-251	-274	-464	-2,278
	13 Non-Core	307	28	81	230	73	-52	-255	433	-548	-5,154	-1,903	-602	-3,787	-10,014
	Total	1,225	292	521	1,280	393	-763	-1,389	-1,905	-3,688	-12,970	-3,631	-1,310	-8,741	-30,686

Trips on the project = 8,326

Table A52: Unadjusted Rail Trips by Vehicles Owned – 2+ Vehicles – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					183	196	1,715	1,248	12,216	2,860	118	971	19,508
	7 WFC						124	16	1,069	753	7,004	1,538	46	474	11,024
	8 Inner VA OR						241	105	775	759	9,946	2,293	80	762	14,962
	9 VA BL/Yellow						136	57	1,091	12,069	20,542	10,160	278	3,458	47,791
	10 Core OR/BL/SL						755	275	1,301	3,250	11,911	4,286	1,061	3,492	26,333
	11 Other Core						338	75	497	2,537	7,605	9,826	301	6,118	27,297
	12 East BL & OR						135	133	714	1,833	14,824	3,722	786	2,759	24,905
	13 Non-Core						343	211	1,518	6,535	32,176	48,406	797	21,491	111,478
Total		0	0	0	0	0	2,256	1,067	8,680	28,984	116,223	83,093	3,469	39,526	283,297

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	116	26	171	47	30	0	723	520	4,871	1,540	22	403	8,489
	2 Spring Hill	40	0	0	30	5	6	0	14	24	356	14	0	8	496
	3 Greensboro	0	0	0	0	0	0	0	14	46	328	37	0	15	438
	4 Tysons Corner	0	0	0	0	7	2	0	72	41	477	110	0	38	746
	5 McLean	26	0	4	0	0	0	0	21	69	754	159	0	33	1,065
	6 Outer VA OR	0	8	0	30	0	54	46	1,171	964	10,018	2,193	68	611	15,164
	7 WFC	0	0	0	0	0	46	0	150	92	2,094	463	12	102	2,958
	8 Inner VA OR	135	92	74	152	49	204	21	450	417	8,859	1,835	45	836	13,170
	9 VA BL/Yellow	52	16	35	55	5	78	36	525	9,642	16,591	10,103	157	3,031	40,325
	10 Core OR/BL/SL	342	93	37	204	67	455	65	1,036	2,931	9,453	3,725	725	2,874	22,007
	11 Other Core	101	0	16	80	20	118	25	407	2,472	6,309	9,113	225	4,940	23,825
	12 East BL & OR	66	2	10	86	14	119	0	609	1,515	12,997	3,039	541	1,892	20,888
	13 Non-Core	45	35	63	73	6	206	17	1,064	5,396	27,678	45,682	575	19,665	100,504
Total		828	362	264	881	219	1,317	211	6,254	24,129	100,784	78,012	2,369	34,447	250,077

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	116	26	171	47	30	0	723	520	4,871	1,540	22	403	8,489
	2 Spring Hill	40	0	0	30	5	6	0	14	24	356	14	0	8	496
	3 Greensboro	0	0	0	0	0	0	0	14	46	328	37	0	15	438
	4 Tysons Corner	0	0	0	0	7	2	0	72	41	477	110	0	38	746
	5 McLean	26	0	4	0	0	0	0	21	69	754	159	0	33	1,065
	6 Outer VA OR	0	8	0	30	0	-129	-150	-544	-284	-2,188	-667	-50	-360	-4,344
	7 WFC	0	0	0	0	0	-78	-16	-920	-661	-4,910	-1,075	-35	372	-8,067
	8 Inner VA OR	135	92	74	152	49	-37	-84	-324	-342	-1,087	-458	-35	74	-1,791
	9 VA BL/Yellow	52	16	35	55	5	58	21	566	-2,427	-5,951	-57	-121	-427	-7,466
	10 Core OR/BL/SL	342	93	37	204	67	-301	-209	-265	-318	-2,458	-562	-336	-618	-4,325
	11 Other Core	101	0	16	80	20	-221	-49	-90	-64	-1,295	-713	-77	1,179	-1,471
	12 East BL & OR	66	2	10	86	14	-16	-133	-105	-318	-1,827	-683	-246	-867	-4,018
	13 Non-Core	45	35	63	73	6	-137	193	-454	1,130	-4,498	-2,725	-222	-1,826	-10,973
Total		828	362	264	881	219	-939	-856	-2,428	4,855	15,439	-5,080	-1,100	-5,079	33,220

Trips on the project = 13,298

Table A53: Unadjusted Rail Trips by Time Period – All Day – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					482	474	2,898	2,027	19,271	4,279	212	1,723	31,366
	7 WFC						362	65	1,867	1,161	10,565	2,545	121	1,063	17,748
	8 Inner VA OR						999	717	2,574	2,588	26,743	5,295	331	2,766	42,012
	9 VA BL/Yellow						625	406	3,058	24,911	53,306	24,754	780	9,680	115,519
	10 Core OR/BL/SL						1,902	1,210	5,933	10,521	43,301	13,175	3,433	12,294	91,769
	11 Other Core						817	425	1,806	7,777	22,726	31,973	851	28,251	94,627
	12 East BL & OR						364	431	1,459	3,832	28,947	7,443	4,428	8,502	55,407
	13 Non-Core						1,086	917	4,590	16,845	73,549	121,939	3,848	83,532	306,307
Total		0	0	0	0	0	6,636	4,645	24,185	69,662	276,408	211,403	14,005	147,811	754,756

Flag cells that exceed:

Abs. Diff.	1,000	
Rel. Diff.	10%	
Abs. Diff.	-1,000	
Rel. Diff.	-10%	

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
	2 Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
	3 Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
	4 Tysons Corner	176	74	26	25	66	20	4	276	163	990	235	9	192	2,255
	5 McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
	6 Outer VA OR	88	18	16	97	42	319	126	2,010	1,486	15,558	3,609	112	1,289	24,769
	7 WFC	16	4	0	13	1	95	17	306	164	3,335	679	29	249	4,908
	8 Inner VA OR	669	215	357	918	262	769	85	2,125	1,746	25,367	4,464	115	2,470	39,560
	9 VA BL/Yellow	162	96	81	197	68	258	85	1,685	20,345	42,788	24,618	536	8,316	99,236
	10 Core OR/BL/SL	786	245	305	982	292	1,102	194	5,144	8,847	37,376	10,628	2,357	8,555	76,814
	11 Other Core	293	59	97	246	74	346	83	1,543	7,759	18,866	29,639	686	22,151	81,853
	12 East BL & OR	178	49	61	291	51	368	44	1,201	3,364	24,300	5,815	2,987	6,225	44,934
	13 Non-Core	542	197	222	660	238	840	74	3,546	15,551	64,166	115,951	2,174	72,293	276,452
Total		3,087	1,174	1,323	3,961	1,246	4,239	724	19,362	60,408	241,868	198,153	9,111	122,570	667,224

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	42	176	118	363	106	65	9	1,180	743	6,776	2,022	52	646	12,298
	2 Spring Hill	56	9	9	65	18	33	2	112	66	623	148	31	83	1,255
	3 Greensboro	25	7	11	42	16	16	0	105	60	541	102	11	37	973
	4 Tysons Corner	176	74	26	25	66	20	4	276	163	990	235	9	192	2,255
	5 McLean	54	26	20	62	13	9	1	127	114	1,182	242	4	65	1,917
	6 Outer VA OR	88	18	16	97	42	-163	-348	-888	-541	-3,713	-670	-100	-433	-6,597
	7 WFC	16	4	0	13	1	-267	-48	-1,560	-997	-7,229	1,866	-92	-814	-12,840
	8 Inner VA OR	669	215	357	918	262	-230	-632	-450	-842	-1,375	-830	-216	-296	-2,452
	9 VA BL/Yellow	162	96	81	197	68	-367	-321	-1,373	-4,566	-8,518	-136	-244	-1,364	-16,284
	10 Core OR/BL/SL	786	245	305	982	292	-800	-1,016	-789	-1,674	-5,924	-2,546	-1,078	-3,739	-14,956
	11 Other Core	293	59	97	246	74	-471	-342	-262	-19	-3,860	-2,334	-156	-6,100	-12,774
	12 East BL & OR	178	49	61	291	51	5	-388	-258	-468	-4,648	-1,628	-1,442	-2,277	-10,473
	13 Non-Core	542	197	222	660	238	-246	-843	-1,044	-1,294	-9,386	-5,988	-1,675	-11,240	-29,854
Total		3,087	1,174	1,323	3,961	1,246	-2,397	-3,922	-4,824	-9,254	34,540	-13,250	-4,895	-25,241	-87,532

Trips on the project = 27,884

Table A54: Unadjusted Rail Trips by Time Period – AM Peak – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					143	193	1,113	897	8,135	1,632	101	679	12,893
	7 WFC						96	15	716	458	4,440	1,017	43	327	7,112
	8 Inner VA OR						289	279	624	818	9,525	1,751	88	860	14,233
	9 VA BL/Yellow						188	143	1,005	7,968	18,807	8,284	188	3,021	39,605
	10 Core OR/BL/SL						339	342	1,493	2,490	11,783	2,894	695	2,509	22,545
	11 Other Core						97	80	423	1,994	6,417	7,946	155	6,019	23,130
	12 East BL & OR						139	193	647	1,555	12,249	2,814	1,158	2,866	21,622
	13 Non-Core						374	410	1,760	6,155	29,338	41,739	1,209	24,990	105,974
Total		0	0	0	0	0	1,666	1,655	7,781	22,336	100,694	68,076	3,637	41,270	247,115

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	10	90	45	106	39	0	0	473	285	2,761	732	16	221	4,777
	2 Spring Hill	0	3	1	7	7	12	0	54	20	226	54	0	42	425
	3 Greensboro	0	3	4	7	3	9	0	31	20	187	24	0	7	295
	4 Tysons Corner	58	21	2	3	20	16	0	76	24	298	51	5	45	618
	5 McLean	27	9	6	15	5	0	1	25	36	498	89	0	49	760
	6 Outer VA OR	52	2	0	0	19	91	45	769	622	6,540	1,295	42	478	9,957
	7 WFC	8	1	0	4	0	24	4	105	86	1,366	364	0	85	1,947
	8 Inner VA OR	278	58	142	286	127	213	14	509	535	9,429	1,524	50	882	14,046
	9 VA BL/Yellow	41	35	33	58	33	66	6	563	6,660	15,810	8,706	158	2,900	35,068
	10 Core OR/BL/SL	286	89	125	262	108	347	26	1,784	2,591	10,867	2,619	771	2,558	22,434
	11 Other Core	52	10	36	59	16	82	14	474	2,286	5,770	7,938	225	6,350	23,293
	12 East BL & OR	79	33	27	84	25	167	27	501	1,326	10,173	2,204	811	2,202	17,659
	13 Non-Core	235	68	98	209	80	314	17	1,389	5,690	25,703	40,170	710	23,261	97,943
Total		1,126	421	518	1,100	481	1,342	153	6,754	20,161	89,627	65,670	2,787	39,081	229,221

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	10	90	45	106	39	0	0	473	285	2,761	732	16	221	4,777
	2 Spring Hill	0	3	1	7	7	12	0	54	20	226	54	0	42	425
	3 Greensboro	0	3	4	7	3	9	0	31	20	187	24	0	7	295
	4 Tysons Corner	58	21	2	3	20	16	0	76	24	298	51	5	45	618
	5 McLean	27	9	6	15	5	0	1	25	36	498	89	0	49	760
	6 Outer VA OR	52	2	0	0	19	-52	-148	-343	-275	-1,595	-337	-59	-200	-2,936
	7 WFC	8	1	0	4	0	-73	-11	-611	-373	-3,074	-752	-43	-242	-5,166
	8 Inner VA OR	278	58	142	286	127	-76	-265	-115	-284	-96	-227	-38	22	-187
	9 VA BL/Yellow	41	35	33	58	33	-122	-138	-442	1,309	-2,997	422	-31	-122	-4,537
	10 Core OR/BL/SL	286	89	125	262	108	8	-316	291	101	-916	-275	76	49	-111
	11 Other Core	52	10	36	59	16	-15	-66	51	273	-646	-8	71	331	162
	12 East BL & OR	79	33	27	84	25	28	-166	-146	-229	-2,076	-610	-347	-663	-3,963
	13 Non-Core	235	68	98	209	80	-61	-393	-371	-464	-3,635	-1,569	-499	-1,728	-8,031
Total		1,126	421	518	1,100	481	-325	-1,502	-1,027	-2,175	-11,066	-2,406	-850	-2,190	-17,893

Trips on the project = 10,033

Table A55: Unadjusted Rail Trips by Time Period – Mid-Day – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					95	86	310	233	2,180	373	29	319	3,625
	7 WFC						80	16	212	160	1,187	246	26	295	2,221
	8 Inner VA OR						205	78	525	482	3,813	719	82	440	6,344
	9 VA BL/Yellow						125	68	510	5,416	8,212	3,550	129	1,734	19,744
	10 Core OR/BL/SL						430	181	1,159	2,858	12,007	3,892	723	3,215	24,465
	11 Other Core						173	93	161	1,499	5,179	7,191	182	5,959	20,436
	12 East BL & OR						41	59	166	604	3,846	1,179	1,293	1,810	8,998
	13 Non-Core						140	43	619	3,112	11,266	19,901	902	17,907	53,980
Total		0	0	0	0	0	1,289	624	3,663	14,363	47,690	37,139	3,365	31,679	139,813

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	15	18	57	15	31	3	124	106	826	267	11	121	1,601
	2 Spring Hill	15	2	3	16	5	7	1	0	8	96	18	5	8	183
	3 Greensboro	6	1	5	17	5	5	0	36	11	56	17	8	7	173
	4 Tysons Corner	43	16	0	4	15	2	4	81	40	137	30	0	57	428
	5 McLean	0	2	3	8	1	3	0	21	20	160	36	0	0	254
	6 Outer VA OR	4	4	1	31	5	66	25	210	210	1,805	531	19	214	3,125
	7 WFC	2	1	0	2	0	25	4	28	0	350	56	15	42	525
	8 Inner VA OR	59	52	19	114	21	171	28	426	385	3,393	580	14	332	5,594
	9 VA BL/Yellow	83	27	14	50	11	54	43	279	4,493	6,932	3,504	140	1,619	17,248
	10 Core OR/BL/SL	185	63	82	256	50	249	65	1,063	2,605	9,900	3,054	639	2,349	20,560
	11 Other Core	121	21	24	74	17	80	43	262	1,775	4,095	6,608	180	5,118	18,418
	12 East BL & OR	23	6	5	70	6	48	0	164	518	2,939	905	770	1,103	6,557
	13 Non-Core	72	42	24	117	26	153	12	489	2,474	9,184	18,005	621	14,181	45,401
Total		619	250	198	815	176	896	226	3,183	12,644	39,874	33,610	2,423	25,152	120,068

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	15	18	57	15	31	3	124	106	826	267	11	121	1,601
	2 Spring Hill	15	2	3	16	5	7	1	0	8	96	18	5	8	183
	3 Greensboro	6	1	5	17	5	5	0	36	11	56	17	8	7	173
	4 Tysons Corner	43	16	0	4	15	2	4	81	40	137	30	0	57	428
	5 McLean	0	2	3	8	1	3	0	21	20	160	36	0	0	254
	6 Outer VA OR	4	4	1	31	5	-28	-60	-100	-23	-375	158	-10	-106	-500
	7 WFC	2	1	0	2	0	-54	-13	185	-160	-837	-189	-10	-252	-1,606
	8 Inner VA OR	59	52	19	114	21	-34	-51	-99	-97	-419	-139	-68	-107	-750
	9 VA BL/Yellow	83	27	14	50	11	-71	-26	-231	-923	-1,289	46	11	-115	-2,495
	10 Core OR/BL/SL	185	63	82	256	50	-181	-117	-96	-254	-2,107	-838	-85	-866	-3,906
	11 Other Core	121	21	24	74	17	-93	-49	101	277	-1,084	-583	-2	-841	-2,018
	12 East BL & OR	23	6	5	70	6	8	-59	-2	-86	-907	-273	-523	-707	-2,440
	13 Non-Core	72	42	24	117	26	13	-31	-129	-639	-2,082	-1,965	-281	-1,726	-8,378
Total		619	250	198	815	176	-394	-397	-480	-1,719	-7,816	3,528	-943	-6,527	-19,746

Trips on the project = 4,421

Table A56: Unadjusted Rail Trips by Time Period – PM Peak – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					177	160	1,103	757	7,078	1,646	82	559	11,561
	7 WFC						130	27	758	459	4,083	988	53	387	6,885
	8 Inner VA OR						357	301	895	982	9,574	1,943	147	1,022	15,220
	9 VA BL/Yellow						237	151	1,133	8,939	19,345	9,221	360	3,713	43,099
	10 Core OR/BL/SL						875	558	2,432	3,756	14,571	4,878	1,691	4,984	33,745
	11 Other Core						344	205	865	3,403	8,760	12,161	356	11,736	37,829
	12 East BL & OR						128	125	493	1,283	10,508	2,608	1,323	2,784	19,252
	13 Non-Core						418	310	1,624	5,404	25,550	41,422	1,070	28,112	103,908
Total		0	0	0	0	0	2,665	1,837	9,303	24,983	99,469	74,867	5,081	53,296	271,500

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	61	39	160	52	30	4	492	270	2,697	830	18	251	4,924
	2 Spring Hill	37	2	3	23	5	12	1	45	29	224	53	26	27	487
	3 Greensboro	17	2	1	12	7	1	0	27	22	234	43	2	17	383
	4 Tysons Corner	33	28	15	11	27	0	1	108	65	414	119	0	90	909
	5 McLean	20	11	8	23	5	4	0	48	49	432	93	3	0	695
	6 Outer VA OR	25	6	10	46	17	114	40	806	531	5,919	1,387	34	435	9,369
	7 WFC	4	2	0	5	1	33	7	131	63	1,310	286	12	92	1,947
	8 Inner VA OR	261	78	159	355	114	262	28	820	595	9,447	1,769	51	909	14,847
	9 VA BL/Yellow	38	27	30	66	22	108	29	643	7,192	16,298	9,967	172	3,064	37,654
	10 Core OR/BL/SL	252	81	92	354	106	408	59	1,735	2,836	13,118	3,988	740	2,891	26,660
	11 Other Core	108	29	38	93	38	163	19	642	2,905	7,648	11,788	236	8,368	32,073
	12 East BL & OR	60	0	20	85	18	125	11	428	1,166	9,256	2,135	943	2,124	16,369
	13 Non-Core	183	61	83	197	128	293	23	1,279	5,497	23,569	42,379	589	25,217	99,497
Total		1,059	387	498	1,427	541	1,551	220	7,204	21,219	90,564	74,833	2,824	43,486	245,813

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	21	61	39	160	52	30	4	492	270	2,697	830	18	251	4,924
	2 Spring Hill	37	2	3	23	5	12	1	45	29	224	53	26	27	487
	3 Greensboro	17	2	1	12	7	1	0	27	22	234	43	2	17	383
	4 Tysons Corner	33	28	15	11	27	0	1	108	65	414	119	0	90	909
	5 McLean	20	11	8	23	5	4	0	48	49	432	93	3	0	695
	6 Outer VA OR	25	6	10	46	17	-63	-120	-297	-226	1,159	-259	-48	-124	2,192
	7 WFC	4	2	0	5	1	-97	-20	-627	396	2,773	702	-42	-295	4,939
	8 Inner VA OR	261	78	159	355	114	-95	-273	-75	-386	-127	-174	-96	-112	-373
	9 VA BL/Yellow	38	27	30	66	22	-128	-123	-489	-1,748	-3,047	745	-188	-548	-5,044
	10 Core OR/BL/SL	252	81	92	354	106	-467	-500	-697	-920	1,453	-890	-951	-2,093	-7,086
	11 Other Core	108	29	38	93	38	-181	-186	-223	-408	1,111	-373	120	-5,368	-5,756
	12 East BL & OR	60	0	20	85	18	-3	-114	-65	-117	1,252	-473	-380	-660	-2,883
	13 Non-Core	183	61	83	197	128	-125	-287	345	93	-1,981	957	-481	-2,895	-4,411
Total		1,059	387	498	1,427	541	-1,114	-1,617	-2,099	-3,764	-8,904	-33	-2,257	-9,810	-25,687

Trips on the project = 10,687

Table A57: Unadjusted Rail Trips by Time Period – Evening + Late Night – Before Conditions

Before		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	6 Outer VA OR	*No Trips in Before Conditions*					67	36	372	140	1,878	629	0	166	3,288
	7 WFC						56	7	180	84	854	294	0	54	1,529
	8 Inner VA OR						148	59	530	306	3,831	882	15	445	6,215
	9 VA BL/Yellow						75	43	410	2,588	4,942	3,699	103	1,212	13,072
	10 Core OR/BL/SL						257	129	849	1,417	4,940	1,511	324	1,586	11,014
	11 Other Core						203	48	357	883	2,370	4,675	159	4,538	13,231
	12 East BL & OR						56	54	152	390	2,344	843	654	1,042	5,536
	13 Non-Core						154	154	587	2,174	7,396	18,788	667	12,523	42,444
Total		0	0	0	0	0	1,016	530	3,438	7,980	28,556	31,321	1,922	21,566	96,329

Flag cells that exceed:

Abs. Diff.	1,000
Rel. Diff.	10%
Abs. Diff.	-1,000
Rel. Diff.	-10%

After		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	11	17	40	0	5	1	92	81	491	193	8	53	996
	2 Spring Hill	4	2	3	18	1	2	0	13	10	77	25	0	6	159
	3 Greensboro	3	1	2	7	1	0	0	12	8	64	19	0	6	121
	4 Tysons Corner	41	10	8	9	5	2	0	11	35	141	35	4	0	301
	5 McLean	8	4	4	15	1	2	0	33	9	93	24	2	15	209
	6 Outer VA OR	7	6	5	20	1	48	16	224	122	1,294	397	17	163	2,319
	7 WFC	1	0	0	2	0	13	2	43	16	310	73	2	29	490
	8 Inner VA OR	70	27	37	164	0	122	16	371	231	3,099	591	0	347	5,073
	9 VA BL/Yellow	0	8	4	23	3	29	8	200	2,000	3,748	2,442	67	733	9,265
	10 Core OR/BL/SL	64	11	5	110	28	98	45	561	816	3,492	968	207	756	7,160
	11 Other Core	12	0	0	21	3	22	8	165	812	1,353	3,305	53	2,315	8,069
	12 East BL & OR	16	11	9	53	2	28	6	108	355	1,932	571	463	796	4,349
	13 Non-Core	53	26	17	138	3	80	22	388	1,890	5,710	15,397	254	9,633	33,611
Total		283	116	109	619	47	450	124	2,221	6,384	21,802	24,039	1,077	14,851	72,122

Change		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
Production Station-Group	1 Wiehle	6	11	17	40	0	5	1	92	81	491	193	8	53	996
	2 Spring Hill	4	2	3	18	1	2	0	13	10	77	25	0	6	159
	3 Greensboro	3	1	2	7	1	0	0	12	8	64	19	0	6	121
	4 Tysons Corner	41	10	8	9	5	2	0	11	35	141	35	4	0	301
	5 McLean	8	4	4	15	1	2	0	33	9	93	24	2	15	209
	6 Outer VA OR	7	6	5	20	1	-20	-20	-148	-17	-585	-232	17	-3	-969
	7 WFC	1	0	0	2	0	-43	-5	-138	-68	-545	-222	2	-24	-1,040
	8 Inner VA OR	70	27	37	164	0	-26	-43	-160	-75	-732	-291	-15	-98	-1,142
	9 VA BL/Yellow	0	8	4	23	3	-46	-35	-210	587	-1,194	-1,257	-36	-479	-3,807
	10 Core OR/BL/SL	64	11	5	110	28	-159	-84	-288	-601	-1,448	-544	-117	-830	-3,854
	11 Other Core	12	0	0	21	3	-181	-41	-191	71	-1,017	-1,370	-105	-2,223	-5,162
	12 East BL & OR	16	11	9	53	2	-28	-48	-44	-35	-412	-271	-192	-246	-1,187
	13 Non-Core	53	26	17	138	3	-73	-132	-199	-285	-1,680	-8,793	-413	-7,890	-19,633
Total		283	116	109	619	47	-565	-406	-1,217	-1,596	-6,754	-13,283	-845	-6,715	-24,206

Trips on the project = 2,743

A5.5 Residence Location to Origin Station Ridership Patterns

The before and after conditions faregate data, weighted from on-board survey data, was used to identify the zip code of residence for riders accessing Orange and Silver Line stations of interest. Riders' zip codes were aggregated into larger zones, whose boundaries are shown in **Figure A8**. After conditions data was headwind-adjusted using the adjustment factor discussed in an earlier section.

Table A58 through **Table A60** show before and after comparisons of zone-based trips by trip purpose. **Table A61** through **Table A65** show before and after comparisons of zone-based trips by income. **Table A66** through **Table A69** show before and after comparisons of zone-based trips by car ownership. **Table A70** through **Table A74** show before and after comparisons of zone-based trips by mode of access.

Figure A8: Residential Home-Trip End Location Zone Boundaries

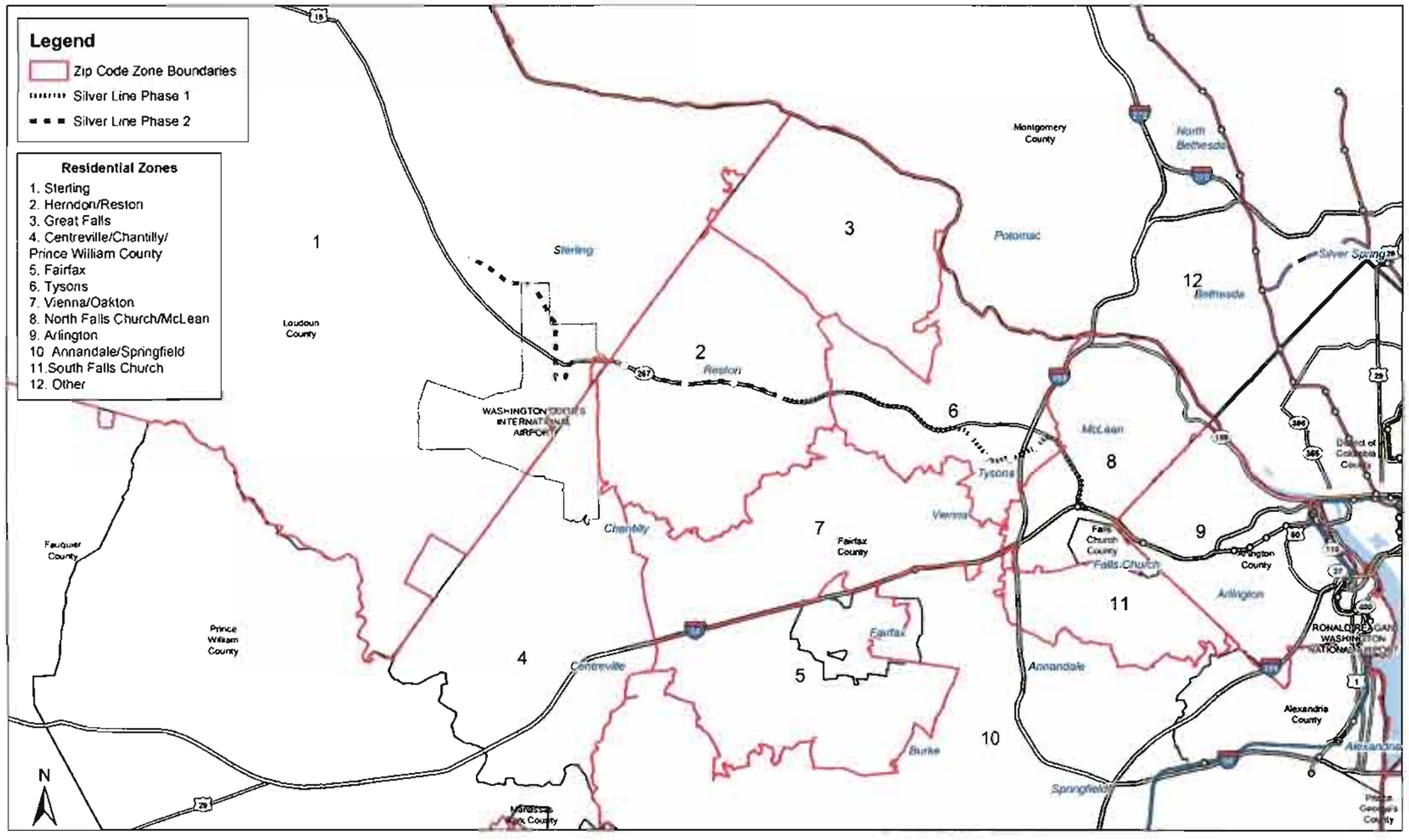


Table A58: Average Weekday Home-Trip End Location by Metrorail Production Station – All Trips

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	648	208	2,375	**3,231**
	Herndon/Reston	-	-	-	-	-	867	44	4,962	**5,873**
	Great Falls	-	-	-	-	-	7	-	161	**169**
	Centreville/Chantilly/PWC	-	-	-	-	-	4,717	22	834	**5,574**
	Fairfax	-	-	-	-	-	3,589	198	35	**3,822**
	Tysons	-	-	-	-	-	257	813	1,124	**2,194**
	Vienna/Oakton	-	-	-	-	-	7,563	2,376	108	**10,047**
	North Falls/McLean	-	-	-	-	-	12	313	5,457	**5,782**
	Arlington	-	-	-	-	-	17	-	66	**83**
	Annandale/Springfield	-	-	-	-	-	3,475	2,164	55	**5,694**
	South Falls	-	-	-	-	-	32	796	314	**1,141**
	Other	-	-	-	-	-	85	30	165	**280**
TOTAL		-	-	-	-	-	**21,269**	**6,963**	**15,656**	**43,888**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,840	19	84	20	65	518	31	460	**5,038**
	Herndon/Reston	7,740	9	75	36	25	278	13	11	**8,188**
	Great Falls	225	24	7	38	47	-	-	20	**362**
	Centreville/Chantilly/PWC	351	31	-	356	9	4,131	89	25	**4,992**
	Fairfax	15	-	-	40	-	3,383	161	21	**3,620**
	Tysons	62	571	512	557	939	113	679	234	**3,667**
	Vienna/Oakton	236	11	48	159	8	7,338	2,669	24	**10,492**
	North Falls/McLean	9	-	-	82	704	-	339	3,857	**4,991**
	Arlington	103	-	26	9	18	23	8	29	**215**
	Annandale/Springfield	62	28	-	142	-	3,384	2,284	155	**6,054**
	South Falls	-	-	-	20	-	28	553	347	**948**
	Other	186	19	7	44	7	307	212	45	**826**
TOTAL		**12,829**	**714**	**759**	**1,501**	**1,821**	**19,503**	**7,037**	**5,230**	**49,395**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,840	19	84	20	65	-130	-177	-1915	**1,807**
	Herndon/Reston	7,740	9	75	36	25	-589	-30	-4951	**2,316**
	Great Falls	225	24	7	38	47	-7	-	-141	**193**
	Centreville/Chantilly/PWC	351	31	-	356	9	-586	67	-809	**-582**
	Fairfax	15	-	-	40	-	-206	-38	-14	**-202**
	Tysons	62	571	512	557	939	-144	-134	-890	**1,473**
	Vienna/Oakton	236	11	48	159	8	-225	293	-84	**445**
	North Falls/McLean	9	-	-	82	704	-12	27	-1600	**-791**
	Arlington	103	-	26	9	18	6	8	-36	**132**
	Annandale/Springfield	62	28	-	142	-	-91	120	100	**360**
	South Falls	-	-	-	20	-	-5	-243	34	**-194**
	Other	186	19	7	44	7	223	182	-121	**547**
TOTAL		**12,829**	**714**	**759**	**1,501**	**1,821**	**-1766**	**74**	**-10426**	**5,507**

Table A59: Average Weekday Home-Trip End Location by Metrorail Production Station – Home-Based Work

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	538	168	2,190	**2,896**
	Herndon/Reston	-	-	-	-	-	613	33	4,528	**5,174**
	Great Falls	-	-	-	-	-	7	-	147	**154**
	Centreville/Chantilly/PWC	-	-	-	-	-	4,253	15	747	**5,015**
	Fairfax	-	-	-	-	-	3,106	198	25	**3,330**
	Tysons	-	-	-	-	-	227	545	974	**1,746**
	Vienna/Oakton	-	-	-	-	-	6,394	2,099	103	**8,595**
	North Falls/McLean	-	-	-	-	-	12	300	4,532	**4,845**
	Arlington	-	-	-	-	-	17	-	46	**63**
	Annandale/Springfield	-	-	-	-	-	2,908	1,817	43	**4,768**
	South Falls	-	-	-	-	-	27	701	252	**979**
	Other	-	-	-	-	-	42	19	138	**199**
TOTAL		-	-	-	-	-	**18,144**	**5,895**	**13,724**	**37,763**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,344	19	31	-	56	498	31	448	**4,426**
	Herndon/Reston	6,792	-	50	36	25	256	13	11	**7,183**
	Great Falls	180	24	7	38	47	-	-	20	**317**
	Centreville/Chantilly/PWC	280	31	-	250	-	3,589	25	7	**4,183**
	Fairfax	-	-	-	40	-	3,133	136	21	**3,330**
	Tysons	62	466	453	461	804	113	616	209	**3,184**
	Vienna/Oakton	110	11	48	108	8	6,755	2,241	24	**9,305**
	North Falls/McLean	-	-	-	43	610	-	277	3,322	**4,252**
	Arlington	74	-	8	-	18	23	8	18	**149**
	Annandale/Springfield	62	21	-	56	-	3,042	1,949	134	**5,264**
	South Falls	-	-	-	-	-	28	442	244	**713**
	Other	152	19	7	15	7	220	178	36	**633**
TOTAL		**11,055**	**592**	**603**	**1,048**	**1,574**	**17,657**	**5,916**	**4,494**	**42,939**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,344	19	31	-	56	-40	-137	-1742	**1,531**
	Herndon/Reston	6,792	-	50	36	25	-357	-20	-4516	**2,009**
	Great Falls	180	24	7	38	47	-7	-	-127	**162**
	Centreville/Chantilly/PWC	280	31	-	250	-	-664	10	-740	**-832**
	Fairfax	-	-	-	40	-	26	-62	-4	**-0**
	Tysons	62	466	453	461	804	-114	71	-765	**1,438**
	Vienna/Oakton	110	11	48	108	8	361	143	-79	**710**
	North Falls/McLean	-	-	-	43	610	-12	-24	-1210	**-593**
	Arlington	74	-	8	-	18	6	8	-28	**86**
	Annandale/Springfield	62	21	-	56	-	135	131	91	**496**
	South Falls	-	-	-	-	-	1	-259	-8	**-266**
	Other	152	19	7	15	7	178	159	-102	**434**
TOTAL		**11,055**	**592**	**603**	**1,048**	**1,574**	**-487**	**20**	**-9230**	**5,175**

Table A60: Average Weekday Home-Trip End Location by Metrorail Production Station – Home-Based Other

Before	Production Station								TOTAL
Home Trip End Location	Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Sterling	-	-	-	-	-	110	40	185	335
Herndon/Reston	-	-	-	-	-	254	10	435	699
Great Falls	-	-	-	-	-	-	-	15	15
Centreville/Chantilly/PWC	-	-	-	-	-	464	7	87	559
Fairfax	-	-	-	-	-	483	-	9	492
Tysons	-	-	-	-	-	29	268	150	448
Vienna/Oakton	-	-	-	-	-	1,169	277	5	1,452
North Falls/McLean	-	-	-	-	-	-	12	924	937
Arlington	-	-	-	-	-	-	-	20	20
Annandale/Springfield	-	-	-	-	-	567	347	12	926
South Falls	-	-	-	-	-	6	95	62	162
Other	-	-	-	-	-	43	11	27	81
TOTAL	-	-	-	-	-	3,125	1,067	1,932	6,125

After	Production Station								TOTAL
Home Trip End Location	Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Sterling	497	-	53	20	10	21	-	12	612
Herndon/Reston	948	9	26	-	-	22	-	-	1,005
Great Falls	46	-	-	-	-	-	-	-	46
Centreville/Chantilly/PWC	71	-	-	106	9	542	64	18	809
Fairfax	15	-	-	-	-	251	24	-	290
Tysons	-	105	60	95	135	-	62	26	483
Vienna/Oakton	126	-	-	51	-	582	428	-	1,187
North Falls/McLean	9	-	-	38	94	-	63	535	739
Arlington	28	-	17	9	-	-	-	11	66
Annandale/Springfield	-	7	-	85	-	342	335	21	790
South Falls	-	-	-	20	-	-	111	104	235
Other	35	-	-	29	-	87	34	9	193
TOTAL	1,775	122	156	453	247	1,846	1,121	736	6,456

Change	Production Station								TOTAL
Home Trip End Location	Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Sterling	497	-	53	20	10	-90	-40	-173	277
Herndon/Reston	948	9	26	-	-	-232	-10	-435	307
Great Falls	46	-	-	-	-	-	-	-15	31
Centreville/Chantilly/PWC	71	-	-	106	9	78	56	-69	250
Fairfax	15	-	-	-	-	-232	24	-9	-202
Tysons	-	105	60	95	135	-29	-206	-125	35
Vienna/Oakton	126	-	-	51	-	-587	150	-5	-264
North Falls/McLean	9	-	-	38	94	-	50	-389	-198
Arlington	28	-	17	9	-	-	-	-9	46
Annandale/Springfield	-	7	-	85	-	-225	-12	9	-136
South Falls	-	-	-	20	-	-6	17	42	73
Other	35	-	-	29	-	44	23	-18	112
TOTAL	1,775	122	156	453	247	-1279	54	-1197	331

Table A61: Average Weekday Home-Trip End Location by Metrorail Production Station – Under $50K/Year

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	87	22	244	353
	Herndon/Reston	-	-	-	-	-	53	-	319	372
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	532	7	129	668
	Fairfax	-	-	-	-	-	509	12	9	530
	Tysons	-	-	-	-	-	37	35	74	147
	Vienna/Oakton	-	-	-	-	-	501	221	5	727
	North Falls/McLean	-	-	-	-	-	-	17	562	580
	Arlington	-	-	-	-	-	10	-	25	35
	Annandale/Springfield	-	-	-	-	-	472	173	17	662
	South Falls	-	-	-	-	-	-	141	47	188
	Other	-	-	-	-	-	38	11	28	77
TOTAL		-	-	-	-	-	2,239	639	1,461	4,339

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	247	-	7	34	20	50	129	-	488
	Herndon/Reston	688	-	-	-	-	-	-	-	688
	Great Falls	15	-	7	-	-	-	-	8	31
	Centreville/Chantilly/PWC	-	-	-	60	-	384	-	-	443
	Fairfax	-	-	-	-	-	275	31	-	306
	Tysons	-	73	-	99	87	-	19	29	306
	Vienna/Oakton	5	-	-	23	-	430	92	-	551
	North Falls/McLean	15	-	-	7	68	15	68	279	453
	Arlington	22	-	-	-	18	4	-	-	43
	Annandale/Springfield	19	-	-	-	-	465	108	18	611
	South Falls	5	-	-	-	-	65	32	29	131
	Other	45	9	-	44	7	55	67	13	239
TOTAL		1,062	82	14	266	199	1,744	546	376	4,289

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	247	-	7	34	20	-37	107	-244	135
	Herndon/Reston	688	-	-	-	-	-53	-	-319	316
	Great Falls	15	-	7	-	-	-	-	8	31
	Centreville/Chantilly/PWC	-	-	-	60	-	-148	-7	-129	-225
	Fairfax	-	-	-	-	-	-234	19	-9	-225
	Tysons	-	73	-	99	87	-37	-17	-45	159
	Vienna/Oakton	5	-	-	23	-	-70	-129	-5	-176
	North Falls/McLean	15	-	-	7	68	-15	-51	-283	-126
	Arlington	22	-	-	-	18	-6	-	-25	8
	Annandale/Springfield	19	-	-	-	-	-7	-64	1	-51
	South Falls	5	-	-	-	-	65	-109	-19	-57
	Other	45	9	-	44	7	17	56	-16	162
TOTAL		1,062	82	14	266	199	-495	-93	-1085	-50

Table A62: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – $50K-$75K/Year

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	44	21	173	**238**
	Herndon/Reston	-	-	-	-	-	89	14	399	**501**
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	538	7	149	**695**
	Fairfax	-	-	-	-	-	431	8	-	**438**
	Tysons	-	-	-	-	-	-	37	159	**195**
	Vienna/Oakton	-	-	-	-	-	610	359	10	978
	North Falls/McLean	-	-	-	-	-	12	76	520	**608**
	Arlington	-	-	-	-	-	-	-	-	-
	Annandale/Springfield	-	-	-	-	-	466	273	-	739
	South Falls	-	-	-	-	-	6	119	54	178
	Other	-	-	-	-	-	13	12	93	**118**
TOTAL		-	-	-	-	-	**2,207**	**926**	**1,556**	**4,689**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	252	-	4	55	-	103	172	44	**630**
	Herndon/Reston	555	-	5	22	-	-	-	-	**582**
	Great Falls	12	19	-	-	-	-	-	-	**32**
	Centreville/Chantilly/PWC	22	-	-	122	-	696	13	7	**859**
	Fairfax	-	-	-	-	-	248	29	-	**276**
	Tysons	-	32	142	132	115	25	63	17	**526**
	Vienna/Oakton	15	11	-	17	-	711	355	-	**1,109**
	North Falls/McLean	-	-	-	-	19	32	49	443	**543**
	Arlington	11	-	-	-	-	-	-	-	**11**
	Annandale/Springfield	27	-	-	38	-	441	173	42	**721**
	South Falls	15	-	-	-	-	79	62	16	**172**
	Other	22	-	-	-	-	96	27	9	**154**
TOTAL		**931**	**62**	**151**	**386**	**135**	**2,430**	**942**	**578**	**5,615**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	252	-	4	55	-	59	150	-129	**392**
	Herndon/Reston	555	-	5	22	-	-89	-14	-399	**80**
	Great Falls	12	19	-	-	-	-	-	-	**32**
	Centreville/Chantilly/PWC	22	-	-	122	-	158	6	-142	**164**
	Fairfax	-	-	-	-	-	-183	21	-	**-162**
	Tysons	-	32	142	132	115	25	27	-142	**331**
	Vienna/Oakton	15	11	-	17	-	101	-4	-10	**131**
	North Falls/McLean	-	-	-	-	19	20	-27	-77	**-64**
	Arlington	11	-	-	-	-	-	-	-	**11**
	Annandale/Springfield	27	-	-	38	-	-25	-100	42	**-19**
	South Falls	15	-	-	-	-	74	-57	-38	**-6**
	Other	22	-	-	-	-	83	15	-84	**36**
TOTAL		**931**	**62**	**151**	**386**	**135**	**223**	**17**	-979	**926**

Table A63: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – $75K-$100K/Year

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	83	14	327	**425**
	Herndon/Reston	-	-	-	-	-	100	-	917	**1,018**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	-	-	-	-	-	667	-	90	**757**
	Fairfax	-	-	-	-	-	405	18	-	**423**
	Tysons	-	-	-	-	-	15	205	148	**367**
	Vienna/Oakton	-	-	-	-	-	994	294	5	**1,292**
	North Falls/McLean	-	-	-	-	-	-	63	750	**813**
	Arlington	-	-	-	-	-	-	-	9	**9**
	Annandale/Springfield	-	-	-	-	-	630	274	14	**919**
	South Falls	-	-	-	-	-	-	184	32	**216**
	Other	-	-	-	-	-	12	7	5	**25**
TOTAL		-	-	-	-	-	**2,906**	**1,061**	**2,297**	**6,264**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	447	-	23	-	-	49	-	78	**597**
	Herndon/Reston	1,071	-	11	-	-	18	-	-	**1,100**
	Great Falls	15	-	-	-	-	-	-	-	**15**
	Centreville/Chantilly/PWC	18	14	-	67	-	425	-	-	**524**
	Fairfax	-	-	-	-	-	383	13	-	**396**
	Tysons	-	138	43	67	179	13	67	12	**519**
	Vienna/Oakton	12	-	-	17	13	580	450	18	**1,091**
	North Falls/McLean	-	-	-	19	61	-	11	420	**512**
	Arlington	17	-	-	-	-	-	8	-	**24**
	Annandale/Springfield	-	-	-	8	-	490	422	12	**931**
	South Falls	-	-	-	20	-	17	55	-	**92**
	Other	27	-	7	-	-	31	57	-	**121**
TOTAL		**1,606**	**152**	**85**	**197**	**254**	**2,005**	**1,083**	**539**	**5,922**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	447	-	23	-	-	-34	-14	-250	**172**
	Herndon/Reston	1,071	-	11	-	-	-83	-	-917	**82**
	Great Falls	15	-	-	-	-	-	-	-	**15**
	Centreville/Chantilly/PWC	18	14	-	67	-	-242	-	-90	**-234**
	Fairfax	-	-	-	-	-	-22	-5	-	**-27**
	Tysons	-	138	43	67	179	-2	-138	-136	**152**
	Vienna/Oakton	12	-	-	17	13	-413	156	13	**-201**
	North Falls/McLean	-	-	-	19	61	-	-52	-330	**-301**
	Arlington	17	-	-	-	-	-	8	-9	**15**
	Annandale/Springfield	-	-	-	8	-	-140	148	-3	**13**
	South Falls	-	-	-	20	-	17	-130	-32	**-124**
	Other	27	-	7	-	-	19	50	-5	**97**
TOTAL		**1,606**	**152**	**85**	**197**	**254**	**-901**	**23**	**-1758**	**-342**

Table A64: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – Over $100K/Year

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	370	130	1,436	**1,937**
	Herndon/Reston	-	-	-	-	-	553	19	2,943	**3,515**
	Great Falls	-	-	-	-	-	7	-	144	**151**
	Centreville/Chantilly/PWC	-	-	-	-	-	2,549	7	448	**3,004**
	Fairfax	-	-	-	-	-	1,963	160	25	**2,148**
	Tysons	-	-	-	-	-	198	492	693	**1,383**
	Vienna/Oakton	-	-	-	-	-	4,824	1,320	70	**6,215**
	North Falls/McLean	-	-	-	-	-	-	113	3,351	**3,464**
	Arlington	-	-	-	-	-	7	-	18	**26**
	Annandale/Springfield	-	-	-	-	-	1,614	1,295	24	**2,933**
	South Falls	-	-	-	-	-	27	337	163	**527**
	Other	-	-	-	-	-	-	-	38	**38**
TOTAL		-	-	-	-	-	**12,112**	**3,875**	**9,355**	**25,342**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	2,319	19	11	20	16	332	31	309	**3,058**
	Herndon/Reston	4,485	9	59	14	17	236	13	11	**4,846**
	Great Falls	139	5	-	38	47	-	-	12	**241**
	Centreville/Chantilly/PWC	200	17	-	80	9	1,995	23	18	**2,341**
	Fairfax	-	-	-	40	-	1,992	75	21	**2,128**
	Tysons	62	290	231	227	464	75	501	139	**1,989**
	Vienna/Oakton	168	-	21	53	8	4,754	1,357	24	**6,383**
	North Falls/McLean	-	-	-	-	410	84	161	2,242	**2,896**
	Arlington	-	-	8	-	-	62	15	-	**86**
	Annandale/Springfield	-	28	-	49	-	1,661	1,312	72	**3,122**
	South Falls	-	-	-	-	-	-	308	222	**530**
	Other	139	9	-	-	9	111	72	41	**382**
TOTAL		7,511	378	330	521	979	11,303	3,867	3,111	28,000

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	2,319	19	11	20	16	-38	-100	-1127	**1,120**
	Herndon/Reston	4,485	9	59	14	17	-317	-6	-2932	**1,330**
	Great Falls	139	5	-	38	47	-7	-	-132	**90**
	Centreville/Chantilly/PWC	200	17	-	80	9	-554	16	-429	**-663**
	Fairfax	-	-	-	40	-	30	-86	-4	**-20**
	Tysons	62	290	231	227	464	-123	8	-554	**606**
	Vienna/Oakton	168	-	21	53	8	-69	36	-47	**169**
	North Falls/McLean	-	-	-	-	410	84	48	-1110	**-568**
	Arlington	-	-	8	-	-	55	15	-18	**60**
	Annandale/Springfield	-	28	-	49	-	47	18	48	**189**
	South Falls	-	-	-	-	-	-27	-29	59	**3**
	Other	139	9	-	-	9	111	72	3	**343**
TOTAL		7,511	378	330	521	979	-809	-8	-6245	**2,658**

Table A65: Average Weekday Home-Trip End Location by Metrorail Production Station – Unknown Income

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	64	20	194	**278**
	Herndon/Reston	-	-	-	-	-	71	10	384	**466**
	Great Falls	-	-	-	-	-	-	-	17	**17**
	Centreville/Chantilly/PWC	-	-	-	-	-	431	-	18	**450**
	Fairfax	-	-	-	-	-	282	-	-	**282**
	Tysons	-	-	-	-	-	7	44	50	**101**
	Vienna/Oakton	-	-	-	-	-	635	182	18	**835**
	North Falls/McLean	-	-	-	-	-	-	44	274	**317**
	Arlington	-	-	-	-	-	-	-	12	**12**
	Annandale/Springfield	-	-	-	-	-	293	149	-	**441**
	South Falls	-	-	-	-	-	-	15	17	**32**
	Other	-	-	-	-	-	22	-	-	**22**
TOTAL		-	-	-	-	-	1,806	462	986	**3,255**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	522	-	23	-	20	159	40	55	**817**
	Herndon/Reston	941	-	-	-	8	24	-	-	**973**
	Great Falls	43	-	-	-	-	-	-	-	**43**
	Centreville/Chantilly/PWC	112	-	-	28	-	463	-	-	**603**
	Fairfax	-	-	-	-	-	426	13	-	**439**
	Tysons	-	38	96	32	94	-	29	38	**327**
	Vienna/Oakton	36	-	27	25	-	791	274	-	**1,153**
	North Falls/McLean	-	-	-	17	110	64	50	283	**524**
	Arlington	53	-	17	-	-	-	-	29	**100**
	Annandale/Springfield	15	-	-	8	-	277	212	12	**525**
	South Falls	36	-	-	-	-	-	29	39	**104**
	Other	17	-	-	-	-	40	-	-	**58**
TOTAL		1,776	38	163	110	232	2,244	648	456	**5,666**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	522	-	23	-	20	95	20	-140	**539**
	Herndon/Reston	941	-	-	-	8	-47	-10	-384	**507**
	Great Falls	43	-	-	-	-	-	-	-17	**26**
	Centreville/Chantilly/PWC	112	-	-	28	-	32	-	-18	**154**
	Fairfax	-	-	-	-	-	144	13	-	**157**
	Tysons	-	38	96	32	94	-7	-15	-13	**225**
	Vienna/Oakton	36	-	27	25	-	156	92	-18	**318**
	North Falls/McLean	-	-	-	17	110	64	7	9	**207**
	Arlington	53	-	17	-	-	-	-	17	**87**
	Annandale/Springfield	15	-	-	8	-	-15	64	12	**84**
	South Falls	36	-	-	-	-	-	14	22	**72**
	Other	17	-	-	-	-	18	-	-	**35**
TOTAL		1,776	38	163	110	232	439	185	-530	**2,412**

Table A66: Average Weekday Home-Trip End Location by Metrorail Production Station – Zero Car Households

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	38	-	11	**48**
	Herndon/Reston	-	-	-	-	-	12	-	150	**162**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	-	-	-	-	-	91	-	38	**129**
	Fairfax	-	-	-	-	-	186	-	-	**186**
	Tysons	-	-	-	-	-	10	-	43	**53**
	Vienna/Oakton	-	-	-	-	-	215	220	-	**435**
	North Falls/McLean	-	-	-	-	-	-	-	233	**233**
	Arlington	-	-	-	-	-	-	-	15	**15**
	Annandale/Springfield	-	-	-	-	-	195	92	7	**294**
	South Falls	-	-	-	-	-	-	76	14	**91**
	Other	-	-	-	-	-	36	11	42	**88**
TOTAL		-	-	-	-	-	782	399	554	**1,735**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	15	-	7	-	-	-	-	1	**23**
	Herndon/Reston	395	-	-	-	-	11	-	-	**406**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	-	-	-	23	-	131	-	-	**154**
	Fairfax	-	-	-	40	-	153	-	-	**193**
	Tysons	-	77	41	75	68	-	29	20	**310**
	Vienna/Oakton	-	-	-	7	-	284	293	-	**583**
	North Falls/McLean	-	-	-	26	6	-	82	256	**371**
	Arlington	39	-	-	9	18	4	8	-	**77**
	Annandale/Springfield	-	21	-	-	-	363	133	-	**517**
	South Falls	-	-	-	-	-	-	71	7	**78**
	Other	47	-	-	44	-	28	55	13	**186**
TOTAL		496	98	48	224	91	974	670	297	**2,899**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	15	-	7	-	-	-38	-	-10	**-26**
	Herndon/Reston	395	-	-	-	-	-1	-	-150	**244**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	-	-	-	23	-	40	-	-38	**25**
	Fairfax	-	-	-	40	-	-32	-	-	**8**
	Tysons	-	77	41	75	68	-10	29	-23	**257**
	Vienna/Oakton	-	-	-	7	-	68	73	-	**148**
	North Falls/McLean	-	-	-	26	6	-	82	23	**137**
	Arlington	39	-	-	9	18	4	8	-15	**62**
	Annandale/Springfield	-	21	-	-	-	168	41	-7	**223**
	South Falls	-	-	-	-	-	-	-5	-7	**-12**
	Other	47	-	-	44	-	-7	44	-29	**98**
TOTAL		496	98	48	224	91	192	272	-257	**1,164**

Table A67: Average Weekday Home-Trip End Location by Metrorail Production Station – One Car Households

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	59	62	446	567
	Herndon/Reston	-	-	-	-	-	218	-	1,485	1,703
	Great Falls	-	-	-	-	-	-	-	24	24
	Centreville/Chantilly/PWC	-	-	-	-	-	1,082	15	204	1,300
	Fairfax	-	-	-	-	-	1,112	19	-	1,131
	Tysons	-	-	-	-	-	22	217	319	558
	Vienna/Oakton	-	-	-	-	-	2,567	879	14	3,460
	North Falls/McLean	-	-	-	-	-	-	135	2,161	2,296
	Arlington	-	-	-	-	-	7	-	25	32
	Annandale/Springfield	-	-	-	-	-	1,231	606	13	1,850
	South Falls	-	-	-	-	-	-	346	95	441
	Other	-	-	-	-	-	26	-	82	109
TOTAL		-	-	-	-	-	6,324	2,278	4,868	13,471

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	697	19	17	-	18	52	13	93	910
	Herndon/Reston	2,351	-	39	22	-	-	-	11	2,423
	Great Falls	27	-	-	-	-	-	-	8	36
	Centreville/Chantilly/PWC	69	14	-	168	-	905	64	25	1,246
	Fairfax	-	-	-	-	-	858	62	-	920
	Tysons	-	193	168	341	396	13	135	83	1,329
	Vienna/Oakton	33	-	5	48	-	2,169	1,266	-	3,520
	North Falls/McLean	9	-	-	17	173	-	70	1,375	1,644
	Arlington	11	-	26	-	-	-	-	18	55
	Annandale/Springfield	46	-	-	8	-	1,401	804	63	2,322
	South Falls	-	-	-	20	-	17	238	46	321
	Other	66	9	7	-	-	123	94	-	299
TOTAL		3,309	236	260	623	588	5,538	2,746	1,724	15,023

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	697	19	17	-	18	-6	-49	-353	343
	Herndon/Reston	2,351	-	39	22	-	-218	-	-1474	720
	Great Falls	27	-	-	-	-	-	-	-15	12
	Centreville/Chantilly/PWC	69	14	-	168	-	-176	49	-179	-55
	Fairfax	-	-	-	-	-	-254	42	-	-211
	Tysons	-	193	168	341	396	-9	-82	-235	771
	Vienna/Oakton	33	-	5	48	-	-399	387	-14	60
	North Falls/McLean	9	-	-	17	173	-	-65	-786	-652
	Arlington	11	-	26	-	-	-7	-	-7	23
	Annandale/Springfield	46	-	-	8	-	170	198	49	471
	South Falls	-	-	-	20	-	17	-108	-49	-120
	Other	66	9	7	-	-	97	94	-82	190
TOTAL		3,309	236	260	623	588	-786	467	-3144	1,552

Table A68: Average Weekday Home-Trip End Location by Metrorail Production Station – Two Plus Car Households

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	552	146	1,865	**2,563**
	Herndon/Reston	-	-	-	-	-	615	44	3,296	**3,955**
	Great Falls	-	-	-	-	-	7	-	138	**145**
	Centreville/Chantilly/PWC	-	-	-	-	-	3,533	7	579	**4,119**
	Fairfax	-	-	-	-	-	2,234	179	35	**2,448**
	Tysons	-	-	-	-	-	224	596	753	**1,573**
	Vienna/Oakton	-	-	-	-	-	4,732	1,254	94	**6,080**
	North Falls/McLean	-	-	-	-	-	12	178	3,041	**3,230**
	Arlington	-	-	-	-	-	10	-	26	**35**
	Annandale/Springfield	-	-	-	-	-	2,049	1,454	35	**3,537**
	South Falls	-	-	-	-	-	32	366	204	**603**
	Other	-	-	-	-	-	22	19	41	**83**
TOTAL		-	-	-	-	-	14,023	4,243	10,106	28,372

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,128	-	61	20	47	466	18	366	**4,106**
	Herndon/Reston	4,994	9	37	14	25	266	13	-	**5,360**
	Great Falls	198	24	7	38	47	-	-	12	**327**
	Centreville/Chantilly/PWC	282	17	-	165	9	3,095	25	-	**3,593**
	Fairfax	15	-	-	-	-	2,372	99	21	**2,507**
	Tysons	62	301	297	141	475	100	514	131	**2,021**
	Vienna/Oakton	203	11	43	104	8	4,859	1,092	24	**6,345**
	North Falls/McLean	-	-	-	38	525	-	188	2,212	**2,962**
	Arlington	52	-	-	-	-	19	-	-	**72**
	Annandale/Springfield	15	7	-	134	-	1,620	1,329	92	**3,198**
	South Falls	-	-	-	-	-	11	244	294	**549**
	Other	73	9	-	-	7	156	64	32	**341**
TOTAL		9,024	380	444	655	1,142	12,964	3,585	3,184	31,379

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	3,128	-	61	20	47	-86	-129	-1499	**1,543**
	Herndon/Reston	4,994	9	37	14	25	-349	-30	-3296	**1,404**
	Great Falls	198	24	7	38	47	-7	-	-126	**181**
	Centreville/Chantilly/PWC	282	17	-	165	9	-438	18	-579	**-526**
	Fairfax	15	-	-	-	-	138	-80	-14	**60**
	Tysons	62	301	297	141	475	-125	-82	-622	**447**
	Vienna/Oakton	203	11	43	104	8	127	-161	-71	**265**
	North Falls/McLean	-	-	-	38	525	-12	10	-829	**-268**
	Arlington	52	-	-	-	-	10	-	-26	**37**
	Annandale/Springfield	15	7	-	134	-	-428	-125	58	**-340**
	South Falls	-	-	-	-	-	-22	-122	90	**-54**
	Other	73	9	-	-	7	133	45	-9	**258**
TOTAL		9,024	380	444	655	1,142	-1059	-658	-6922	3,007

Table A69: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – Unknown Auto Ownership

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-		-	-	53	53
	Herndon/Reston	-	-	-	-	-	21	-	31	52
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	12	-	13	26
	Fairfax	-	-	-	-	-	57	-	-	57
	Tysons	-	-	-	-	-	-		9	9
	Vienna/Oakton	-	-	-	-	-	48	23	-	72
	North Falls/McLean	-	-	-	-	-	-	-	22	22
	Arlington	-	-	-	-	-	-	-	-	-
	Annandale/Springfield	-	-	-	-	-	-	12	-	12
	South Falls	-	-	-	-	-	-	7	-	7
	Other	-	-	-	-	-	-	-	-	-
TOTAL		-	-	-	-	-	139	43	128	310

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	-	-	-	-
	Herndon/Reston	-	-	-	-	-	-	-	-	-
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	-	-	-	-
	Fairfax	-	-	-	-	-	-	-	-	-
	Tysons	-	-	7	-	-	-	-	-	7
	Vienna/Oakton	-	-	-	-	-	26	18		44
	North Falls/McLean	-	-	-	-	-	-	-	14	14
	Arlington	-	-	-	-	-	-	-	11	11
	Annandale/Springfield	-	-	-	-	-	-	18	-	18
	South Falls	-	-	-	-	-	-	-	-	-
	Other	-	-	-	-	-	-	-	-	-
TOTAL		-	-	7	-	-	26	35	25	94

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	-	-	-53	-53
	Herndon/Reston	-	-	-	-	-	-21	-	-31	-52
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	-12	-	-13	-26
	Fairfax	-	-	-	-	-	-57	-	-	-57
	Tysons	-	-	7	-	-	-	-	-9	-2
	Vienna/Oakton	-	-	-	-	-	-22	-6	-	-28
	North Falls/McLean	-	-	-	-	-	-	-	-8	-8
	Arlington	-	-	-	-	-	-	-	11	11
	Annandale/Springfield	-	-	-	-	-	-	6	-	6
	South Falls	-	-	-	-	-	-	-7	-	-7
	Other	-	-	-	-	-	-	-	-	-
TOTAL		-	-	7	-	-	-113	-7	-103	-216

Table A70: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – Walk Access

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	14	-	-	14
	Herndon/Reston	-	-	-	-	-	-	-	32	32
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	-	-	-	-	-	7	7	-	14
	Fairfax	-	-	-	-	-	49	-	-	49
	Tysons	-	-	-	-	-	-	27	17	45
	Vienna/Oakton	-	-	-	-	-	1,537	1,460	-	2,998
	North Falls/McLean	-	-	-	-	-	-	117	1,234	1,351
	Arlington	-	-	-	-	-	7	-	34	41
	Annandale/Springfield	-	-	-	-	-	1,303	403	-	1,706
	South Falls	-	-	-	-	-	-	115	5	120
	Other	-	-	-	-	-	-	-	90	90
TOTAL		-	-	-	-	-	2,917	2,130	1,411	6,458

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	44	-	-	77	-	280	416	-	816
	Herndon/Reston	327	-	-	-	-	17	-	-	344
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	13	-	-	8	-	26	30	-	77
	Fairfax	-	-	-	-	-	12	-	-	12
	Tysons	-	206	203	272	517	-	22	-	1,220
	Vienna/Oakton	28	-	30	-	13	1,307	1,456	-	2,834
	North Falls/McLean	-	-	-	-	173	-	84	771	1,029
	Arlington	28	-	8	-	18	-	8	18	80
	Annandale/Springfield	-	-	-	-	-	1,209	577	-	1,786
	South Falls	-	-	-	-	-	40	85	-	124
	Other	13	9	-	16	-	74	102	-	215
TOTAL		453	216	241	373	722	2,964	2,779	790	8,537

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	44	-	-	77	-	267	416	-	803
	Herndon/Reston	327	-	-	-	-	17	-	-32	312
	Great Falls	-	-	-	-	-	-	-	-	-
	Centreville/Chantilly/PWC	13	-	-	8	-	19	22	-	62
	Fairfax	-	-	-	-	-	-37	-	-	-37
	Tysons	-	206	203	272	517	-	-6	-17	1,175
	Vienna/Oakton	28	-	30	-	13	-231	-4	-	-164
	North Falls/McLean	-	-	-	-	173	-	-33	-463	-323
	Arlington	28	-	8	-	18	-7	8	-15	39
	Annandale/Springfield	-	-	-	-	-	-94	175	-	80
	South Falls	-	-	-	-	-	40	-30	-5	4
	Other	13	9	-	16	-	74	102	-90	125
TOTAL		453	216	241	373	722	47	649	-622	2,079

Table A71: Average Weekday Home-Trip End Location by Metrorail Production Station – Kiss & Ride Access

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	54	33	39	**126**
	Herndon/Reston	-	-	-	-	-	79	-	36	**115**
	Great Falls	-	-	-	-	-	-	-	11	**11**
	Centreville/Chantilly/PWC	-	-	-	-	-	216	7	-	**224**
	Fairfax	-	-	-	-	-	329	8	-	**336**
	Tysons	-	-	-	-	-	27	67	91	**184**
	Vienna/Oakton	-	-	-	-	-	734	182	5	**921**
	North Falls/McLean	-	-	-	-	-	-	37	549	**586**
	Arlington	-	-	-	-	-	-	-	-	-
	Annandale/Springfield	-	-	-		-	249	241	12	**503**
	South Falls	-	-	-	-	-	-	90	22	**112**
	Other	-	-	-	-	-	34	-	15	**49**
TOTAL		-	-	-	-	-	**1,723**	**665**	**780**	**3,167**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	148	-	34	-	-	170	13	-	**365**
	Herndon/Reston	887	-	66	36	25	29	-	-	**1,043**
	Great Falls	70	-	-	-	-	-	-	-	**70**
	Centreville/Chantilly/PWC	103	14	-	-	-	415	-	-	**533**
	Fairfax	-	-	-	-	-	319	-	-	**319**
	Tysons	-	100	168	68	94	12	57	-	**499**
	Vienna/Oakton	15	-	11	8	8	856	220	-	**1,117**
	North Falls/McLean	-	-	-	-	211	58	24	485	**778**
	Arlington	36	-	-	-	-	-	-	-	**36**
	Annandale/Springfield	34	-	-	8	-	453	145	30	**670**
	South Falls	-	-	-	-	-	47	114	27	**188**
	Other	24	-	7	-	7	27	29	12	**105**
TOTAL		**1,316**	**115**	**286**	**120**	**345**	**2,385**	**603**	**554**	**5,724**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	148	-	34	-	-	116	-20	-39	**239**
	Herndon/Reston	887	-	66	36	25	-50	-	-36	**928**
	Great Falls	70	-	-	-	-	-	-	-11	**59**
	Centreville/Chantilly/PWC	103	14	-	-	-	199	-7	-	**309**
	Fairfax	-	-	-	-	-	-10	-8	-	**-18**
	Tysons	-	100	168	68	94	-15	-10	-91	**315**
	Vienna/Oakton	15	-	11	8	8	122	38	-5	**197**
	North Falls/McLean	-	-	-	-	211	58	-13	-64	**192**
	Arlington	36	-	-	-	-	-	-	-	**36**
	Annandale/Springfield	34	-	-	8	-	204	-96	17	**167**
	South Falls	-	-	-	-	-	47	24	5	77
	Other	24	-	7	-	7	-7	29	-3	56
TOTAL		**1,316**	**115**	**286**	**120**	**345**	**663**	**-62**	**-226**	**2,557**

Table A72: Average Weekday Home-Trip End Location by Metrorail Production Station – Park & Ride Access

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	518	165	603	**1,287**
	Herndon/Reston	-	-	-	-	-	745	44	305	**1,093**
	Great Falls	-	-	-	-	-	7	-	122	129
	Centreville/Chantilly/PWC	-	-	-	-	-	2,235	7	79	**2,321**
	Fairfax	-	-	-	-	-	2,099	191	21	**2,310**
	Tysons	-	-	-	-	-	213	495	676	**1,384**
	Vienna/Oakton	-	-	-	-	-	3,539	430	53	**4,022**
	North Falls/McLean	-	-	-	-	-	12	146	2,659	**2,817**
	Arlington	-	-	-	-	-	-	-	26	**26**
	Annandale/Springfield	-	-	-	-	-	1,139	1,271	31	**2,442**
	South Falls	-	-	-	-	-	27	411	267	705
	Other	-	-	-	-	-	15	7	20	**42**
TOTAL		-	-	-	-	-	10,549	3,168	4,862	18,579

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	2,133	19	27	20	57	347	18	74	**2,694**
	Herndon/Reston	3,380	-	9	-	-	204	13	11	**3,618**
	Great Falls	155	5	7	38	47	-	-	-	**252**
	Centreville/Chantilly/PWC	134	-	-	71	9	1,934	25	18	**2,191**
	Fairfax	-	-	-	-	-	2,230	161	21	**2,412**
	Tysons	62	117	60	62	182	101	440	221	**1,246**
	Vienna/Oakton	259	-	7	44	-	3,552	431	24	**4,315**
	North Falls/McLean	-	-	-	38	147	127	93	1,288	**1,693**
	Arlington	17	-	17	-	-	-	-	-	**34**
	Annandale/Springfield	-	-	-	8	-	940	1,020	105	**2,073**
	South Falls	88	-	-	-	-	182	206	206	**682**
	Other	63	9	-	-	-	76	49	9	**207**
TOTAL		**6,290**	**150**	**128**	**281**	**442**	**9,693**	**2,455**	**1,978**	**21,417**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	2,133	19	27	20	57	-172	-148	-529	1,407
	Herndon/Reston	3,380	-	9	-	-	-541	-30	-294	**2,524**
	Great Falls	155	5	7	38	47	-7	-	-122	**123**
	Centreville/Chantilly/PWC	134	-	-	71	9	-301	18	-60	**-131**
	Fairfax	-	-	-	-	-	131	-30	0	**102**
	Tysons	62	117	60	62	182	-112	-55	-455	**-139**
	Vienna/Oakton	259	-	7	44	-	13	0	-29	**294**
	North Falls/McLean	-	-	-	38	147	115	-53	-1370	**-1123**
	Arlington	17	-	17	-	-	-	-	-26	7
	Annandale/Springfield	-	-	-	8	-	-199	-251	73	**-369**
	South Falls	88	-	-	-	-	155	-205	-61	**-23**
	Other	63	9	-	-	-	62	41	-11	**165**
TOTAL		**6,290**	**150**	**128**	**281**	**442**	**-856**	**-713**	**-2884**	**2,838**

Table A73: Average Weekday Home-Trip End Location by Metrorail Production Station – Bus Access

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	62	10	1,703	**1,774**
	Herndon/Reston	-	-	-	-	-	43	-	4,586	**4,628**
	Great Falls	-	-	-	-	-	-	-	29	**29**
	Centreville/Chantilly/PWC	-	-	-	-	-	2,223	-	751	**2,974**
	Fairfax	-	-	-	-	-	1,050	-	14	**1,064**
	Tysons	-	-	-	-	-	10	89	279	**378**
	Vienna/Oakton	-	-	-	-	-	1,357	145	45	**1,547**
	North Falls/McLean	-	-	-	-	-	-	13	510	**523**
	Arlington	-	-	-	-	-	10	-	6	**16**
	Annandale/Springfield	-	-	-	-	-	657	206	11	**874**
	South Falls	-	-	-	-	-	6	101	19	**127**
	Other	-	-	-	-	-	20	-	16	**36**
TOTAL		-	-	-	-	-	5,437	564	7,969	**13,970**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	1,268	-	-	17	-	130	45	374	**1,835**
	Herndon/Reston	2,770	9	-	-	-	28	-	-	**2,808**
	Great Falls	-	19	-	-	-	-	-	20	**40**
	Centreville/Chantilly/PWC	104	17	-	277	-	1,674	-	7	**2,079**
	Fairfax	-	-	-	40	-	645	-	-	**685**
	Tysons	-	72	-	138	87	-	85	13	**395**
	Vienna/Oakton	28	11	-	85	6	931	103	-	**1,164**
	North Falls/McLean	15	-	-	43	87	42	81	373	**642**
	Arlington	22	-	-	9	-	23	-	-	**54**
	Annandale/Springfield	28	21	-	49	-	543	115	21	**776**
	South Falls	39	-	-	-	-	11	-	11	**60**
	Other	32	-	-	27	-	79	32	24	**195**
TOTAL		4,306	150	-	684	180	4,106	462	843	**10,731**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	1,268	-	-	17	-	68	36	-1329	**60**
	Herndon/Reston	2,770	9	-	-	-	-15	-	-4586	**-1821**
	Great Falls	-	19	-	-	-	-	-	-9	**11**
	Centreville/Chantilly/PWC	104	17	-	277	-	-549	-	-743	**-894**
	Fairfax	-	-	-	40	-	-406	-	-14	**-380**
	Tysons	-	72	-	138	87	-10	-4	-266	**17**
	Vienna/Oakton	28	11	-	85	6	-427	-41	-45	**-383**
	North Falls/McLean	15	-	-	43	87	42	68	-136	**119**
	Arlington	22	-	-	9	-	14	-	-6	**39**
	Annandale/Springfield	28	21	-	49	-	-114	-91	9	**-98**
	South Falls	39	-	-	-	-	5	-101	-9	**-67**
	Other	32	-	-	27	-	60	32	8	**159**
TOTAL		4,306	150	-	684	180	-1331	-102	-7126	**-3238**

Table A74: Average Weekday Home-Trip End Location by Metrorail Production Station – Before Conditions – Other Access

Before		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	-	-	-	-	-	-	-	30	**30**
	Herndon/Reston	-	-	-	-	-	-	-	5	**5**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	-	-	-	-	-	36	-	5	**41**
	Fairfax	-	-	-	-	-	62	-	-	**62**
	Tysons	-	-	-	-	-	7	134	61	**202**
	Vienna/Oakton	-	-	-	-	-	396	158	5	**560**
	North Falls/McLean	-	-	-	-	-	-	-	505	**505**
	Arlington	-	-	-	-	-	-	-	-	**-**
	Annandale/Springfield	-	-	-	-	-	126	42	-	**168**
	South Falls	-	-	-	-	-	-	79	-	**79**
	Other	-	-	-	-	-	16	22	25	**64**
TOTAL		-	-	-	-	-	644	436	635	**1,715**

After		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	235	-	23	-	9	13	23	12	**315**
	Herndon/Reston	376	-	-	-	-	-	-	-	**376**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	9	-	-	-	-	92	-	-	**102**
	Fairfax	-	-	-	-	-	136	-	-	**136**
	Tysons	-	75	82	17	58	-	74	-	**307**
	Vienna/Oakton	-	-	-	-	-	472	85	-	**557**
	North Falls/McLean	-	-	-	-	71	24	20	480	**594**
	Arlington	-	-	-	-	-	-	-	11	**11**
	Annandale/Springfield	-	-	-	-	-	145	143	-	**288**
	South Falls	56	-	23	-	-	-	55	-	**135**
	Other	54	-	-	-	-	50	-	-	**105**
TOTAL		731	75	129	17	138	932	401	503	**2,925**

Change		Production Station								TOTAL
		Wiehle	Spring Hill	Greensboro	Tysons	McLean	Vienna	Dunn Loring	WFC	
Home Trip End Location	Sterling	235	-	23	-	9	13	23	-18	**285**
	Herndon/Reston	376	-	-	-	-	-	-	-5	**371**
	Great Falls	-	-	-	-	-	-	-	-	**-**
	Centreville/Chantilly/PWC	9	-	-	-	-	57	-	-5	**61**
	Fairfax	-	-	-	-	-	73	-	-	**73**
	Tysons	-	75	82	17	58	-7	-60	-61	**104**
	Vienna/Oakton	-	-	-	-	-	75	-73	-5	**-3**
	North Falls/McLean	-	-	-	-	71	24	20	-25	**89**
	Arlington	-	-	-	-	-	-	-	11	**11**
	Annandale/Springfield	-	-	-	-	-	19	101	-	**120**
	South Falls	56	-	23	-	-	-	-23	-	**56**
	Other	54	-	-	-	-	34	-22	-25	**41**
TOTAL		731	75	129	17	138	288	-35	-132	**1,210**

A5.6 Projected vs Actual Station-Group-to-Station-Group Ridership

The ridership forecasts produced from a run of the Entry to Final Design phase travel demand model were compared against actual ridership data. **Table A75** through **Table A94** depict the projected and actual station group to station group trips, and the percent error for each station group origin/destination pair. **Figure A9** through **Figure A16** visualize this comparison.

Table A75: Entry to Final Design Model Run (2011 Opening Day Forecast Year) – Baseline Model Station-Group to Station-Group Ridership Forecasts – All Trips

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2	Spring Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4	Tysons	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5	McLean	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6	Outer Orange	0	0	0	0	0	149	39	5,675	1,829	5,115	1,847	12,183	144	**26,981**
7	West Falls Church	0	0	0	0	0	140	-	2,012	1,316	3,946	1,499	9,298	85	**18,296**
8	Inner VA Orange/Silver	0	0	0	0	0	1,405	1,291	7,988	5,262	14,443	4,890	34,777	337	**70,393**
9	VA Blue/Yellow	0	0	0	0	0	885	2,305	5,509	23,241	26,292	7,641	39,865	543	**106,281**
10	Other Core	0	0	0	0	0	209	520	3,127	4,624	25,902	18,512	32,436	822	**86,152**
11	Non-Core	0	0	0	0	0	663	2,964	6,636	10,371	89,841	84,198	95,511	3,302	**293,486**
12	Core Orange/Blue/Silver	0	0	0	0	0	563	1,257	6,561	6,390	24,607	13,515	46,247	2,075	**101,215**
13	East Blue & Orange	0	0	0	0	0	165	600	1,272	1,839	11,109	7,136	27,983	2,957	**53,061**
Total		**0**	**0**	**0**	**0**	**0**	**4,179**	**8,976**	**38,780**	**54,872**	**201,255**	**139,238**	**298,300**	**10,265**	**755,865**

Table A76: Entry to Final Design Model Run (2011 Opening Day Forecast Year) – Build Model Station-Group to Station-Group Ridership Forecasts – All Trips

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	2,428	766	1,646	855	1,010	86	3,420	1,185	4,275	1,734	9,130	65	**26,600**
2	Spring Hill	313	-	312	374	107	101	34	517	144	452	188	953	8	**3,503**
3	Greensboro	128	303	-	392	98	74	33	317	115	238	94	488	6	**2,286**
4	Tysons	484	679	456	-	287	166	77	590	141	259	113	539	3	**3,794**
5	McLean	335	293	140	279	-	209	8	363	192	552	239	1,325	11	**3,946**
6	Outer Orange	1,181	1,317	386	656	410	156	39	4,975	1,427	4,249	1,603	10,192	125	**26,716**
7	West Falls Church	194	180	104	246	31	57	-	961	575	1,620	524	4,140	38	**8,670**
8	Inner VA Orange/Silver	1,365	2,067	687	1,060	698	1,330	213	8,426	5,455	15,006	5,169	35,377	352	**77,205**
9	VA Blue/Yellow	777	1,777	264	349	228	782	156	5,764	24,136	26,596	7,901	39,756	573	**109,059**
10	Other Core	316	334	88	163	103	210	80	3,271	4,692	26,037	18,678	33,083	831	**87,886**
11	Non-Core	1,443	4,729	343	488	352	676	226	6,963	10,610	90,367	86,712	96,390	3,378	**302,677**
12	Core Orange/Blue/Silver	730	798	191	339	242	551	200	6,705	6,239	25,046	13,762	46,534	2,099	**103,436**
13	East Blue & Orange	209	888	64	67	49	173	63	1,294	1,852	11,032	7,269	27,533	3,007	**53,500**
Total		**7,475**	**15,793**	**3,801**	**6,059**	**3,460**	**5,495**	**1,215**	**43,566**	**56,763**	**205,729**	**143,986**	**305,440**	**10,496**	**809,278**

Table A77: Entry to Final Design Model Run (2011 Opening Day Forecast Year) – Build minus Baseline Station-Group to Station-Group Ridership Forecasts – All Trips

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	2,428	766	1,646	855	1,010	86	3,420	1,185	4,275	1,734	9,130	65	**26,600**
2	Spring Hill	313	-	312	374	107	101	34	517	144	452	188	953	8	**3,503**
3	Greensboro	128	303	-	392	98	74	33	317	115	238	94	488	6	**2,286**
4	Tysons	484	679	456	-	287	166	77	590	141	259	113	539	3	**3,794**
5	McLean	335	293	140	279	-	209	8	363	192	552	239	1,325	11	**3,946**
6	Outer Orange	1,181	1,317	386	656	410	7	0	-700	-402	-866	-244	-1,991	-19	**-265**
7	West Falls Church	194	180	104	246	31	-83	-	-1,051	-741	-2,326	-975	-5,158	-47	**-9,626**
8	Inner VA Orange/Silver	1,365	2,067	687	1,060	698	-75	-1,078	438	193	563	279	600	15	**6,812**
9	VA Blue/Yellow	777	1,777	264	349	228	-103	-2,149	255	895	304	260	-109	30	**2,778**
10	Other Core	316	334	88	163	103	1	-440	144	68	135	166	647	9	**1,734**
11	Non-Core	1,443	4,729	343	488	352	13	-2,738	327	239	526	2,514	879	76	**9,191**
12	Core Orange/Blue/Silver	730	798	191	339	242	-12	-1,057	144	-151	439	247	287	24	**2,221**
13	East Blue & Orange	209	888	64	67	49	8	-537	22	13	-77	133	-450	50	**439**
Total		**7,475**	**15,793**	**3,801**	**6,059**	**3,460**	**1,316**	**-7,761**	**4,786**	**1,891**	**4,474**	**4,748**	**7,140**	**231**	**53,413**

Table A78: Year 2016 Actual Station-Group to Station-Group Ridership (Headwind-Adjusted) – All Trips

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	49	202	136	417	122	75	10	1,355	853	2,322	742	7,783	60	**14,126**
2	Spring Hill	64	11	10	74	20	38	3	129	76	170	96	716	36	**1,442**
3	Greensboro	29	8	13	49	18	18	0	121	69	117	42	621	12	**1,117**
4	Tysons	202	85	29	29	76	22	5	317	188	270	220	1,137	10	**2,591**
5	McLean	62	30	23	71	14	10	1	146	130	278	74	1,358	5	**2,202**
6	Outer Orange	101	20	18	112	48	366	145	2,309	1,707	4,145	1,481	17,871	128	**28,451**
7	West Falls Church	18	5	0	14	1	109	19	352	189	780	286	3,831	33	**5,638**
8	Inner VA Orange/Silver	768	247	410	1,054	300	883	98	2,441	2,005	5,128	2,837	29,138	132	**45,441**
9	VA Blue/Yellow	186	110	93	227	78	296	97	1,936	23,369	28,278	9,553	49,148	616	**113,987**
10	Other Core	337	68	112	283	85	398	96	1,773	8,912	34,045	25,443	21,671	798	**94,021**
11	Non-Core	623	227	255	758	273	965	85	4,073	17,862	133,187	83,039	73,704	2,497	**317,547**
12	Core Orange/Blue/Silver	903	281	350	1,128	336	1,266	223	5,909	10,162	12,208	9,827	42,932	2,708	**88,232**
13	East Blue & Orange	205	56	70	334	59	423	50	1,380	3,865	6,680	7,151	27,912	3,430	**51,613**
Total		**3,546**	**1,349**	**1,520**	**4,549**	**1,431**	**4,869**	**831**	**22,240**	**69,388**	**227,608**	**140,790**	277,822	**10,465**	**766,407**

Table A79: Percent Error in Forecast Station-Group to Station-Group Ridership – All Trips

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	N/A	-92%	-82%	-75%	-86%	-93%	-89%	-60%	-28%	-46%	-57%	-15%	-8%	-47%
2	Spring Hill	-79%	N/A	-97%	-80%	-81%	-63%	-92%	-75%	-47%	-62%	-49%	-25%	345%	-59%
3	Greensboro	-77%	-97%	N/A	-88%	-81%	-76%	-99%	-62%	-40%	-51%	-55%	27%	101%	-51%
4	Tysons	-58%	-87%	-94%	N/A	-73%	-86%	-94%	-46%	33%	4%	95%	111%	243%	-32%
5	McLean	-82%	-90%	-83%	-75%	N/A	-95%	-82%	-60%	-32%	-50%	-69%	2%	-56%	-44%
6	Outer Orange	-91%	-98%	-95%	-83%	-88%	135%	272%	-54%	20%	-2%	-8%	75%	3%	6%
7	West Falls Church	-91%	-97%	-100%	-94%	-97%	92%	N/A	-63%	-67%	-52%	-46%	-7%	-13%	-35%
8	Inner VA Orange/Silver	-44%	-88%	-40%	-1%	-57%	-34%	-54%	-71%	-63%	-66%	-45%	-18%	-63%	-41%
9	VA Blue/Yellow	-76%	-94%	-65%	-35%	-66%	-62%	-38%	-66%	-3%	6%	21%	24%	8%	5%
10	Other Core	7%	-80%	27%	74%	-17%	89%	20%	-46%	90%	31%	36%	-34%	-4%	7%
11	Non-Core	-57%	-95%	-26%	55%	-22%	43%	-63%	-42%	68%	47%	-4%	-24%	-26%	5%
12	Core Orange/Blue/Silver	24%	-65%	83%	233%	39%	130%	11%	-12%	63%	-51%	-29%	-8%	29%	-15%
13	East Blue & Orange	-2%	-94%	9%	399%	20%	145%	-21%	7%	109%	-39%	-2%	1%	14%	-4%
Total		-53%	-91%	-60%	-25%	-59%	-11%	-32%	-49%	22%	11%	-2%	-9%	0%	-5%

Table A80: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Baseline Model Station-Group to Station-Group Ridership Forecasts – Home-Based Work

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2	Spring Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4	Tysons	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5	McLean	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6	Outer Orange	0	0	0	0	0	108	20	4,495	1,059	3,240	1,350	8,335	92	**18,699**
7	West Falls Church	0	0	0	0	0	98	0	1,777	965	2,707	1,199	6,954	65	**13,765**
8	Inner VA Orange/Silver	0	0	0	0	0	972	1,001	3,796	3,258	10,691	2,992	27,913	204	**50,827**
9	VA Blue/Yellow	0	0	0	0	0	560	1,875	3,685	14,182	19,623	5,403	29,331	351	**75,010**
10	Other Core	0	0	0	0	0	68	297	1,042	1,710	10,388	5,264	13,428	174	**32,371**
11	Non-Core	0	0	0	0	0	476	2,132	4,590	6,101	61,577	41,238	70,721	1,586	**188,421**
12	Core Orange/Blue/Silver	0	0	0	0	0	211	697	2,381	2,023	8,242	3,331	21,007	500	**38,392**
13	East Blue & Orange	0	0	0	0	0	124	435	986	1,323	8,228	4,099	21,662	1,452	**38,309**
Total		**0**	**0**	**0**	**0**	**0**	**2,617**	**6,457**	**22,752**	**30,621**	**124,696**	**64,876**	**199,351**	**4,424**	**455,794**

Table A81: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Build Model Station-Group to Station-Group Ridership Forecasts – Home-Based Work

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	1,225	702	1,273	729	623	71	2,784	679	2,291	1,184	5,749	40	**17,350**
2	Spring Hill	225	-	59	67	41	59	20	359	70	250	140	625	6	**1,921**
3	Greensboro	76	23	-	20	10	39	13	195	30	115	56	276	3	**856**
4	Tysons	285	103	83	-	66	90	28	302	17	74	42	166	1	**1,257**
5	McLean	258	46	41	46	-	147	1	245	109	346	172	887	7	**2,305**
6	Outer Orange	957	470	346	547	369	117	22	4,205	1,011	3,084	1,260	7,844	87	**20,319**
7	West Falls Church	184	134	94	201	21	38	-	831	491	1,298	441	3,391	31	**7,155**
8	Inner VA Orange/Silver	1,093	765	605	751	492	969	99	3,954	3,439	10,822	3,111	27,844	220	**54,164**
9	VA Blue/Yellow	480	395	234	282	196	512	104	3,924	15,230	20,110	5,728	29,660	382	**77,237**
10	Other Core	113	82	43	70	42	75	27	1,117	1,801	10,465	5,500	13,661	183	**33,179**
11	Non-Core	736	1,071	314	433	299	501	181	4,796	6,445	62,339	43,851	71,106	1,628	**193,700**
12	Core Orange/Blue/Silver	283	185	104	146	103	223	51	2,435	1,924	8,194	3,424	20,696	530	**38,298**
13	East Blue & Orange	107	201	62	67	49	132	43	1,020	1,346	8,156	4,246	21,327	1,501	**38,257**
Total		**4,797**	**4,700**	**2,687**	**3,903**	**2,417**	**3,525**	**660**	**26,167**	**32,592**	**127,544**	**69,155**	**203,232**	**4,619**	**485,998**

Table A82: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Build minus Baseline Station-Group to Station-Group Ridership Forecasts – Home-Based Work

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	1,225	702	1,273	729	623	71	2,784	679	2,291	1,184	5,749	40	**17,350**
2	Spring Hill	225	-	59	67	41	59	20	359	70	250	140	625	6	**1,921**
3	Greensboro	76	23	-	20	10	39	13	195	30	115	56	276	3	**856**
4	Tysons	285	103	83	-	66	90	28	302	17	74	42	166	1	**1,257**
5	McLean	258	46	41	46	-	147	1	245	109	346	172	887	7	**2,305**
6	Outer Orange	957	470	346	547	369	9	2	-290	-48	-156	-90	-491	-5	**1,620**
7	West Falls Church	184	134	94	201	21	-60	-	-946	-474	-1,409	-758	-3,563	-34	**-6,610**
8	Inner VA Orange/Silver	1,093	765	605	751	492	-3	-902	158	181	131	119	-69	16	**3,337**
9	VA Blue/Yellow	480	395	234	282	196	-48	-1,771	239	1,048	487	325	329	31	**2,227**
10	Other Core	113	82	43	70	42	7	-270	75	91	77	236	233	9	**808**
11	Non-Core	736	1,071	314	433	299	25	-1,951	206	344	762	2,613	385	42	**5,279**
12	Core Orange/Blue/Silver	283	185	104	146	103	12	-646	54	-99	-48	93	-311	30	**-94**
13	East Blue & Orange	107	201	62	67	49	8	-392	34	23	-72	147	-335	49	**-52**
Total		**4,797**	**4,700**	**2,687**	**3,903**	**2,417**	**908**	**-5,797**	**3,415**	**1,971**	**2,848**	**4,279**	**3,881**	**195**	**30,204**

Table A83: Year 2016 Actual Station-Group to Station-Group Ridership (Headwind-Adjusted) – Home-Based Work

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	176	105	202	95	8	0	1,141	603	1,678	544	6,534	20	**11,106**
2	Spring Hill	31	0	0	11	0	3	0	16	39	62	12	495	28	**697**
3	Greensboro	0	0	0	13	8	0	0	36	41	76	21	438	0	**633**
4	Tysons	124	47	0	0	8	4	0	100	10	95	42	650	0	**1,080**
5	McLean	51	0	8	17	0	0	0	84	89	173	46	1,131	0	**1,599**
6	Outer Orange	77	9	11	66	37	181	80	1,874	1,366	3,272	1,079	15,625	102	**23,779**
7	West Falls Church	5	1	0	5	0	37	0	242	183	593	172	3,220	7	**4,464**
8	Inner VA Orange/Silver	657	165	352	784	270	543	30	1,218	1,300	3,723	2,003	22,565	63	**33,673**
9	VA Blue/Yellow	122	48	56	161	75	177	14	1,170	16,012	21,655	6,244	38,557	364	**84,655**
10	Other Core	137	0	67	135	63	208	15	1,080	5,080	18,921	12,529	13,363	390	**51,988**
11	Non-Core	418	106	225	528	226	682	46	3,285	13,387	98,961	53,742	59,015	1,174	**231,793**
12	Core Orange/Blue/Silver	498	86	228	666	234	628	59	3,270	4,447	5,715	4,222	24,243	1,153	**45,450**
13	East Blue & Orange	152	53	58	320	44	328	15	1,205	3,264	5,135	4,975	23,138	2,021	**40,708**
Total		**2,273**	**691**	**1,109**	**2,907**	**1,059**	**2,800**	**259**	**14,719**	**45,823**	**160,059**	**85,630**	**208,973**	**5,322**	**531,624**

Table A84: Percent Error in Forecast Station-Group to Station-Group Ridership – Home-Based Work

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	N/A	-86%	-85%	-84%	-87%	-99%	-100%	-59%	-11%	-27%	-54%	14%	-49%	-36%
2	Spring Hill	-86%	N/A	-100%	-83%	-100%	-96%	-100%	-96%	-44%	-75%	-91%	-21%	359%	-64%
3	Greensboro	-100%	-100%	N/A	-34%	-17%	-100%	-100%	-82%	37%	-34%	-63%	59%	-100%	-26%
4	Tysons	-56%	-54%	-100%	N/A	-88%	-95%	-100%	-67%	-42%	28%	0%	291%	-100%	-14%
5	McLean	-80%	-100%	-81%	-63%	N/A	-100%	-100%	-66%	-18%	-50%	-73%	28%	-100%	-31%
6	Outer Orange	-92%	-98%	-97%	-88%	-90%	55%	262%	-55%	35%	6%	-14%	99%	18%	17%
7	West Falls Church	-97%	-100%	-100%	-98%	-100%	-3%	N/A	-71%	-63%	-54%	-61%	-5%	-79%	-38%
8	Inner VA Orange/Silver	-40%	-78%	-42%	4%	-45%	-44%	-70%	-69%	-62%	-66%	-36%	-19%	-71%	-38%
9	VA Blue/Yellow	-75%	-88%	-76%	-43%	-62%	-65%	-87%	-70%	5%	8%	9%	30%	-5%	10%
10	Other Core	22%	-100%	55%	92%	50%	178%	-44%	-3%	182%	81%	128%	-2%	113%	57%
11	Non-Core	-43%	-90%	-28%	22%	-25%	36%	-75%	-32%	108%	59%	23%	-17%	-28%	20%
12	Core Orange/Blue/Silver	76%	-53%	119%	356%	127%	181%	16%	34%	131%	-30%	23%	17%	118%	19%
13	East Blue & Orange	42%	-74%	-6%	378%	-10%	149%	-65%	18%	143%	-37%	17%	8%	35%	6%
Total		-53%	-85%	-59%	-26%	-56%	-21%	-61%	-44%	41%	25%	24%	3%	15%	9%

Table A85: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Baseline Model Station-Group to Station-Group Ridership Forecasts – Home-Based Other

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2	Spring Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4	Tysons	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5	McLean	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6	Outer Orange	0	0	0	0	0	12	7	460	216	1,120	201	2,116	16	**4,148**
7	West Falls Church	0	0	0	0	0	11	0	81	171	816	157	1,387	6	**2,629**
8	Inner VA Orange/Silver	0	0	0	0	0	122	53	967	441	1,851	832	3,367	40	**7,673**
9	VA Blue/Yellow	0	0	0	0	0	136	143	372	2,427	3,333	813	5,454	64	**12,742**
10	Other Core	0	0	0	0	0	4	11	309	362	6,632	5,588	7,016	88	**20,010**
11	Non-Core	0	0	0	0	0	39	511	785	1,418	17,304	23,456	14,285	755	**58,553**
12	Core Orange/Blue/Silver	0	0	0	0	0	23	27	408	456	4,145	2,620	6,332	300	**14,311**
13	East Blue & Orange	0	0	0	0	0	12	114	107	238	1,828	1,924	3,647	779	**8,649**
Total		**0**	**0**	**0**	**0**	**0**	**359**	**866**	**3,489**	**5,729**	**37,029**	**35,591**	**43,604**	**2,048**	**128,715**

Table A86: Entry to Final Design Model Run (2011 Opening Day Forecast Year) – Build Model Station-Group to Station-Group Ridership Forecasts – Home-Based Other

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	851	10	193	56	224	8	339	175	1,024	271	1,576	11	**4,738**
2	Spring Hill	20	-	39	75	10	16	4	63	12	114	18	179	0	**550**
3	Greensboro	8	35	-	47	4	9	5	40	5	55	11	86	0	**305**
4	Tysons	46	131	7	-	10	17	13	81	7	66	11	134	0	**523**
5	McLean	16	96	5	37	-	22	2	44	13	108	21	227	1	**592**
6	Outer Orange	68	470	11	30	11	10	7	300	107	754	142	1,432	13	**3,355**
7	West Falls Church	3	17	1	15	2	5	-	48	21	202	39	427	3	**783**
8	Inner VA Orange/Silver	66	578	12	92	65	110	27	1,079	450	2,200	933	3,920	35	**9,567**
9	VA Blue/Yellow	96	872	1	11	3	109	15	378	2,381	3,166	790	5,092	72	**12,986**
10	Other Core	8	36	0	2	2	6	4	333	355	6,650	5,546	7,172	82	**20,196**
11	Non-Core	445	3,049	1	7	12	36	14	861	1,399	17,179	23,383	14,630	767	**61,783**
12	Core Orange/Blue/Silver	13	93	0	6	4	22	13	439	442	4,351	2,694	6,560	291	**14,928**
13	East Blue & Orange	79	600	0	0	0	11	5	102	233	1,834	1,919	3,543	778	**9,104**
Total		**868**	**6,828**	**87**	**515**	**179**	**597**	**117**	**4,107**	**5,600**	**37,703**	**35,778**	**44,978**	**2,053**	**139,410**

Table A87: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Build minus Baseline Station-Group to Station-Group Ridership Forecasts – Home-Based Other

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	851	10	193	56	224	8	339	175	1,024	271	1,576	11	4,738
2	Spring Hill	20	-	39	75	10	16	4	63	12	114	18	179	0	550
3	Greensboro	8	35	-	47	4	9	5	40	5	55	11	86	0	305
4	Tysons	46	131	7	-	10	17	13	81	7	66	11	134	0	523
5	McLean	16	96	5	37	-	22	2	44	13	108	21	227	1	592
6	Outer Orange	68	470	11	30	11	-2	0	-160	-109	-366	-59	-684	-3	-793
7	West Falls Church	3	17	1	15	2	-6	-	-33	-150	-614	-118	-960	-3	-1,846
8	Inner VA Orange/Silver	66	578	12	92	65	-12	-26	112	9	349	101	553	-5	1,894
9	VA Blue/Yellow	96	872	1	11	3	-27	-128	6	-46	-167	-23	-362	8	244
10	Other Core	8	36	0	2	2	2	-7	24	-7	18	-42	156	-6	186
11	Non-Core	445	3,049	1	7	12	-3	-497	76	-19	-125	-73	345	12	3,230
12	Core Orange/Blue/Silver	13	93	0	6	4	-1	-14	31	-14	206	74	228	-9	617
13	East Blue & Orange	79	600	0	0	0	-1	-109	-5	-5	6	-5	-104	-1	455
Total		868	6,828	87	515	179	238	-749	618	-129	674	187	1,374	5	10,695

Table A88: Year 2016 Actual Station-Group to Station-Group Ridership (Headwind-Adjusted) – Home-Based Other

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	0	7	169	15	47	0	130	110	485	80	785	30	**1,860**
2	Spring Hill	0	0	0	7	0	13	0	8	9	11	0	75	0	**124**
3	Greensboro	0	0	0	11	0	0	0	16	12	22	0	62	0	**122**
4	Tysons	11	0	0	0	0	0	0	87	68	32	36	224	0	**458**
5	McLean	9	6	0	0	0	4	0	11	25	83	0	131	0	**269**
6	Outer Orange	16	0	0	23	0	93	28	352	295	650	223	1,495	0	**3,176**
7	West Falls Church	0	0	0	0	0	62	0	69	0	148	76	418	13	**786**
8	Inner VA Orange/Silver	45	0	29	221	12	227	26	774	425	866	525	4,219	40	**7,410**
9	VA Blue/Yellow	31	19	17	38	0	78	48	542	3,233	4,506	1,993	6,200	136	**16,842**
10	Other Core	23	24	0	6	0	61	28	263	1,362	5,238	4,560	2,379	147	**14,089**
11	Non-Core	121	42	23	169	14	184	13	476	2,941	23,996	19,389	9,275	893	**57,537**
12	Core Orange/Blue/Silver	124	15	25	127	5	167	35	858	1,609	1,819	1,988	6,583	634	**13,988**
13	East Blue & Orange	33	2	0	0	0	37	0	132	406	1,239	1,595	3,174	945	**7,561**
Total		**413**	**108**	**101**	**771**	**46**	**973**	**178**	**3,717**	**10,495**	**39,095**	**30,466**	**35,021**	**2,838**	**124,223**

Table A89: Percent Error in Forecast Station-Group to Station-Group Ridership – Home-Based Other

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	N/A	-100%	-30%	-12%	-73%	-79%	-100%	-62%	-37%	-53%	-70%	-50%	175%	**-61%**
2	Spring Hill	-100%	N/A	-100%	-90%	-100%	-16%	-100%	-88%	-23%	-90%	-100%	-58%	N/A	**-77%**
3	Greensboro	-100%	-99%	N/A	-77%	-100%	-100%	-100%	-61%	133%	-60%	-100%	-28%	N/A	**-60%**
4	Tysons	-76%	-100%	-100%	N/A	-100%	-100%	-100%	8%	871%	-52%	229%	67%	N/A	**-12%**
5	McLean	-43%	-94%	-100%	-100%	N/A	-80%	-100%	-75%	91%	-23%	-100%	-42%	-100%	**-54%**
6	Outer Orange	-76%	-100%	-100%	-24%	-100%	826%	299%	17%	176%	-14%	57%	4%	-100%	**-5%**
7	West Falls Church	-100%	-100%	-100%	-100%	-100%	1137%	N/A	44%	-100%	-27%	95%	-2%	321%	**0%**
8	Inner VA Orange/Silver	-32%	-100%	138%	140%	-81%	106%	-5%	-28%	-6%	-61%	-44%	8%	15%	**-23%**
9	VA Blue/Yellow	-67%	-98%	1637%	242%	-100%	-28%	221%	43%	36%	42%	152%	22%	89%	**30%**
10	Other Core	189%	-35%	N/A	207%	-100%	915%	599%	-21%	284%	-21%	-18%	-67%	79%	**-30%**
11	Non-Core	-73%	-99%	2246%	2319%	16%	411%	-7%	-45%	110%	40%	-17%	-37%	16%	**-7%**
12	Core Orange/Blue/Silver	853%	-84%	N/A	2011%	22%	659%	167%	95%	264%	-58%	-26%	0%	118%	**-6%**
13	East Blue & Orange	-58%	-100%	N/A	N/A	N/A	233%	-100%	29%	74%	-32%	-17%	-10%	21%	**-17%**
Total		**-52%**	**-98%**	**16%**	**50%**	**-74%**	**63%**	**52%**	**-9%**	**87%**	**4%**	**-15%**	**-22%**	**38%**	-11%

Table A90: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Baseline Model Station-Group to Station-Group Ridership Forecasts – Non-Home-Based

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2	Spring Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3	Greensboro	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4	Tysons	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5	McLean	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
6	Outer Orange	0	0	0	0	0	29	12	720	554	755	296	1,732	36	**4,134**
7	West Falls Church	0	0	0	0	0	31	#VALUE!	154	180	423	143	957	14	**1,902**
8	Inner VA Orange/Silver	0	0	0	0	0	311	237	3,225	1,563	1,901	1,066	3,497	93	**11,893**
9	VA Blue/Yellow	0	0	0	0	0	189	287	1,452	6,632	3,336	1,425	5,080	128	**18,529**
10	Other Core	0	0	0	0	0	137	212	1,776	2,552	8,882	7,660	11,992	560	**33,771**
11	Non-Core	0	0	0	0	0	148	321	1,261	2,852	10,960	19,504	10,505	961	**46,512**
12	Core Orange/Blue/Silver	0	0	0	0	0	329	533	3,772	3,911	12,220	7,564	18,908	1,275	**48,512**
13	East Blue & Orange	0	0	0	0	0	29	51	179	278	1,053	1,113	2,674	726	**6,103**
Total		**0**	**0**	**0**	**0**	**0**	**1,203**	**1,653**	**12,539**	**18,522**	**39,530**	**38,771**	**55,345**	**3,793**	**171,356**

Table A91: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Build Model Station-Group to Station-Group Ridership Forecasts – Non-Home-Based

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	352	54	180	70	163	7	297	331	960	279	1,805	14	**4,512**
2	Spring Hill	68	-	214	232	56	26	10	95	62	88	30	149	2	**1,032**
3	Greensboro	44	245	-	325	84	26	15	82	80	68	27	126	3	**1,125**
4	Tysons	153	445	366	-	211	59	36	207	117	119	60	239	2	**2,014**
5	McLean	61	151	94	196	-	40	5	74	70	98	46	211	3	**1,049**
6	Outer Orange	156	377	29	79	30	29	10	470	309	411	201	916	25	**3,042**
7	West Falls Church	7	29	9	30	8	14	-	82	63	120	44	322	4	**732**
8	Inner VA Orange/Silver	206	724	70	217	141	251	87	3,393	1,566	1,984	1,125	3,613	97	**13,474**
9	VA Blue/Yellow	201	510	29	56	29	161	37	1,462	6,525	3,320	1,383	5,004	119	**18,836**
10	Other Core	195	216	45	91	59	129	49	1,821	2,536	8,922	7,632	12,250	566	**34,511**
11	Non-Core	262	609	28	48	41	139	31	1,306	2,766	10,849	19,478	10,654	983	**47,194**
12	Core Orange/Blue/Silver	434	520	87	187	135	306	136	3,831	3,873	12,501	7,644	19,278	1,278	**50,210**
13	East Blue & Orange	23	87	2	0	0	30	15	172	273	1,042	1,104	2,663	728	**6,139**
Total		**1,810**	**4,265**	**1,027**	**1,641**	**864**	**1,373**	**438**	**13,292**	**18,571**	**40,482**	**39,053**	**57,230**	**3,824**	**183,870**

Table A92: Entry to Final Design Model Run (2011 Opening Day Forecast Year) –
Build minus Baseline Station-Group to Station-Group Ridership Forecasts – Non-Home-Based

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	-	352	54	180	70	163	7	297	331	960	279	1,805	14	**4,512**
2	Spring Hill	68	-	214	232	56	26	10	95	62	88	30	149	2	**1,032**
3	Greensboro	44	245	-	325	84	26	15	82	80	68	27	126	3	**1,125**
4	Tysons	153	445	366	-	211	59	36	207	117	119	60	239	2	**2,014**
5	McLean	61	151	94	196	-	40	5	74	70	98	46	211	3	**1,049**
6	Outer Orange	156	377	29	79	30	0	-2	-250	-245	-344	-95	-816	-11	**-1,092**
7	West Falls Church	7	29	9	30	8	-17	-	-72	-117	-303	-99	-635	-10	**-1,170**
8	Inner VA Orange/Silver	206	724	70	217	141	-60	-150	168	3	83	59	116	4	**1,581**
9	VA Blue/Yellow	201	510	29	56	29	-28	-250	10	-107	-16	-42	-76	-9	**307**
10	Other Core	195	216	45	91	59	-8	-163	45	-16	40	-28	258	6	**740**
11	Non-Core	262	609	28	48	41	-9	-290	45	-86	-111	-26	149	22	**682**
12	Core Orange/Blue/Silver	434	520	87	187	135	-23	-397	59	-38	281	80	370	3	**1,698**
13	East Blue & Orange	23	87	2	0	0	1	-36	-7	-5	-11	-9	-11	2	**36**
Total		**1,810**	**4,265**	**1,027**	**1,641**	**864**	**170**	**-1,215**	**753**	**49**	**952**	**282**	**1,885**	**31**	**12,514**

Table A93: Year 2016 Actual Station-Group to Station-Group Ridership (Headwind-Adjusted) – Non-Home-Based

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	49	26	24	45	12	19	10	84	140	160	118	464	9	**1,159**
2	Spring Hill	33	11	10	56	20	22	3	105	28	96	84	146	8	**620**
3	Greensboro	29	7	13	24	10	18	0	70	16	20	21	121	12	**362**
4	Tysons	66	38	29	29	68	18	5	130	110	143	142	264	10	**1,052**
5	McLean	2	24	16	54	14	5	1	51	16	21	28	96	5	**334**
6	Outer Orange	8	11	7	23	11	92	37	82	46	223	179	751	26	**1,497**
7	West Falls Church	12	4	0	10	1	10	19	41	6	39	38	194	14	**388**
8	Inner VA Orange/Silver	66	82	29	50	18	113	42	449	280	538	308	2,354	28	**4,358**
9	VA Blue/Yellow	33	43	20	28	3	41	35	224	4,123	2,117	1,315	4,391	116	**12,490**
10	Other Core	176	44	45	142	22	129	53	430	2,470	9,886	8,355	5,929	262	**27,944**
11	Non-Core	84	79	7	61	33	99	26	312	1,534	10,230	9,908	5,414	430	**28,217**
12	Core Orange/Blue/Silver	281	179	97	336	98	471	129	1,781	4,106	4,674	3,617	12,106	920	**28,794**
13	East Blue & Orange	20	1	12	14	14	58	35	44	194	307	581	1,600	465	**3,344**
Total		**859**	**549**	**310**	**871**	**325**	**1,096**	**395**	**3,803**	**13,071**	**28,454**	**24,694**	**33,828**	**2,305**	**110,560**

Table A94: Percent Error in Forecast Station-Group to Station-Group Ridership – Non-Home-Based

Production Station-Group		Attraction Station-Group													Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Wiehle	N/A	-93%	-55%	-75%	-83%	-88%	39%	-72%	-58%	-83%	-58%	-74%	-34%	**-74%**
2	Spring Hill	-51%	N/A	-95%	-76%	-64%	-17%	-74%	11%	-56%	9%	179%	-2%	302%	**-40%**
3	Greensboro	-34%	-97%	N/A	-92%	-88%	-32%	-98%	-15%	-80%	-71%	-22%	-4%	302%	**-68%**
4	Tysons	-57%	-91%	-92%	N/A	-68%	-69%	-87%	-37%	-6%	20%	136%	10%	415%	**-48%**
5	McLean	-97%	-84%	-84%	-73%	N/A	-86%	-71%	-31%	-77%	-78%	-38%	-55%	63%	**-68%**
6	Outer Orange	-95%	-97%	-77%	-71%	-62%	219%	275%	-82%	-85%	-46%	-11%	-18%	4%	**-51%**
7	West Falls Church	76%	-85%	-97%	-67%	-89%	-26%	N/A	-50%	-90%	-68%	-15%	-40%	245%	**-47%**
8	Inner VA Orange/Silver	-68%	-89%	-58%	-77%	-87%	-55%	-51%	-87%	-82%	-73%	-73%	-35%	-71%	**-68%**
9	VA Blue/Yellow	-84%	-92%	-30%	-50%	-90%	-75%	-5%	-85%	-37%	-36%	-5%	-12%	-2%	**-34%**
10	Other Core	-10%	-80%	1%	56%	-62%	0%	8%	-76%	-3%	11%	9%	-52%	-54%	**-19%**
11	Non-Core	-68%	-87%	-75%	27%	-19%	-29%	-18%	-76%	-45%	-6%	-49%	-49%	-56%	**-40%**
12	Core Orange/Blue/Silver	-35%	-65%	11%	79%	-28%	54%	-5%	-54%	6%	-63%	-53%	-37%	-28%	**-43%**
13	East Blue & Orange	-15%	-99%	489%	N/A	N/A	94%	132%	-74%	-29%	-71%	-47%	-40%	-36%	**-46%**
Total		**-53%**	**-87%**	**-70%**	**-47%**	**-62%**	**-20%**	**-10%**	-71%	**-30%**	**-30%**	**-37%**	**-41%**	-40%	**-40%**

Figure A9: Comparison of Projected and Actual Production Trips - All Trip Purposes

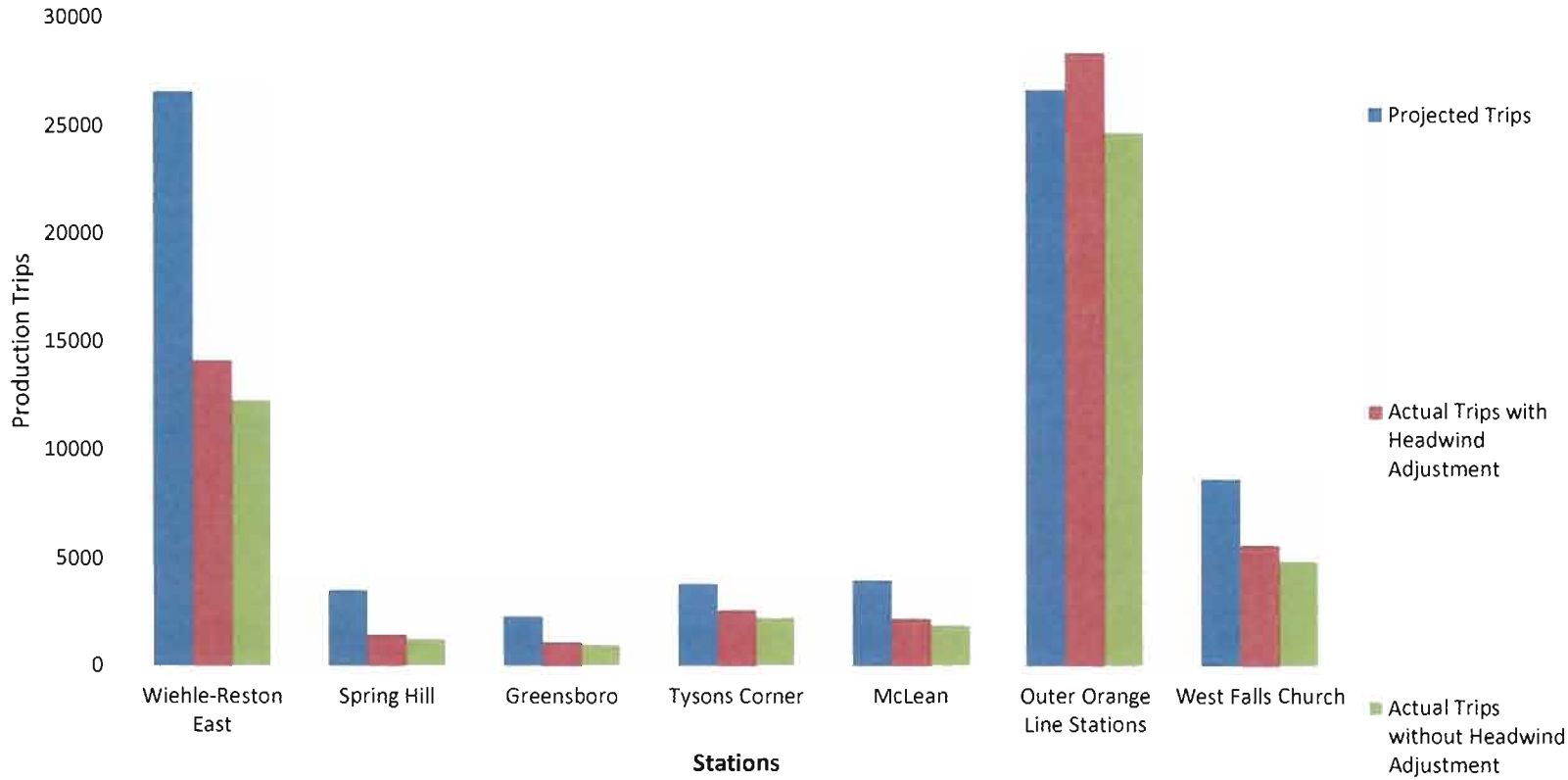


Figure A10: Comparison of Projected and Actual Attraction Trips - All Trip Purposes

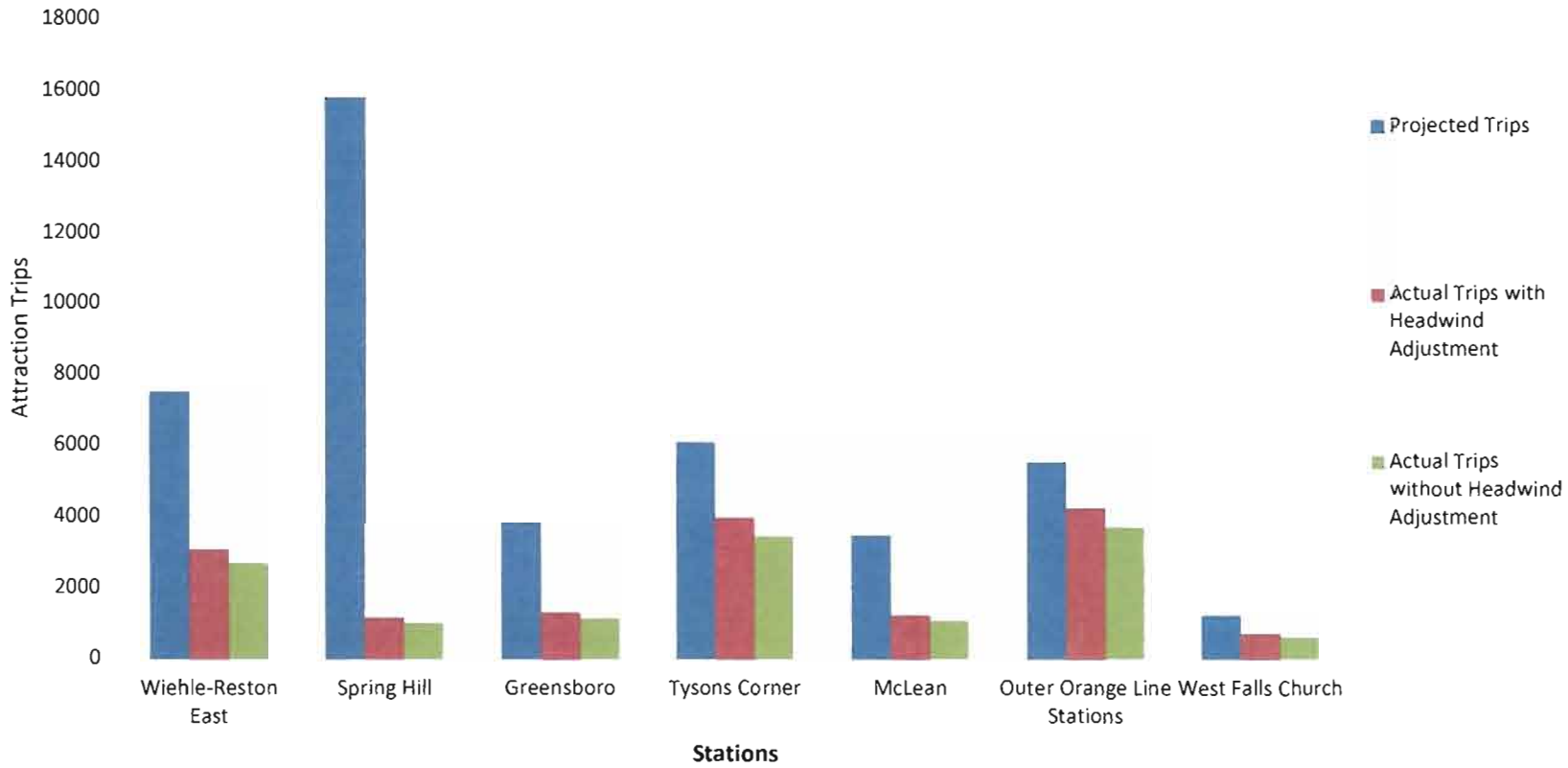


Figure A11: Comparison of Projected and Actual Production Trips – Home-Based Work Trips

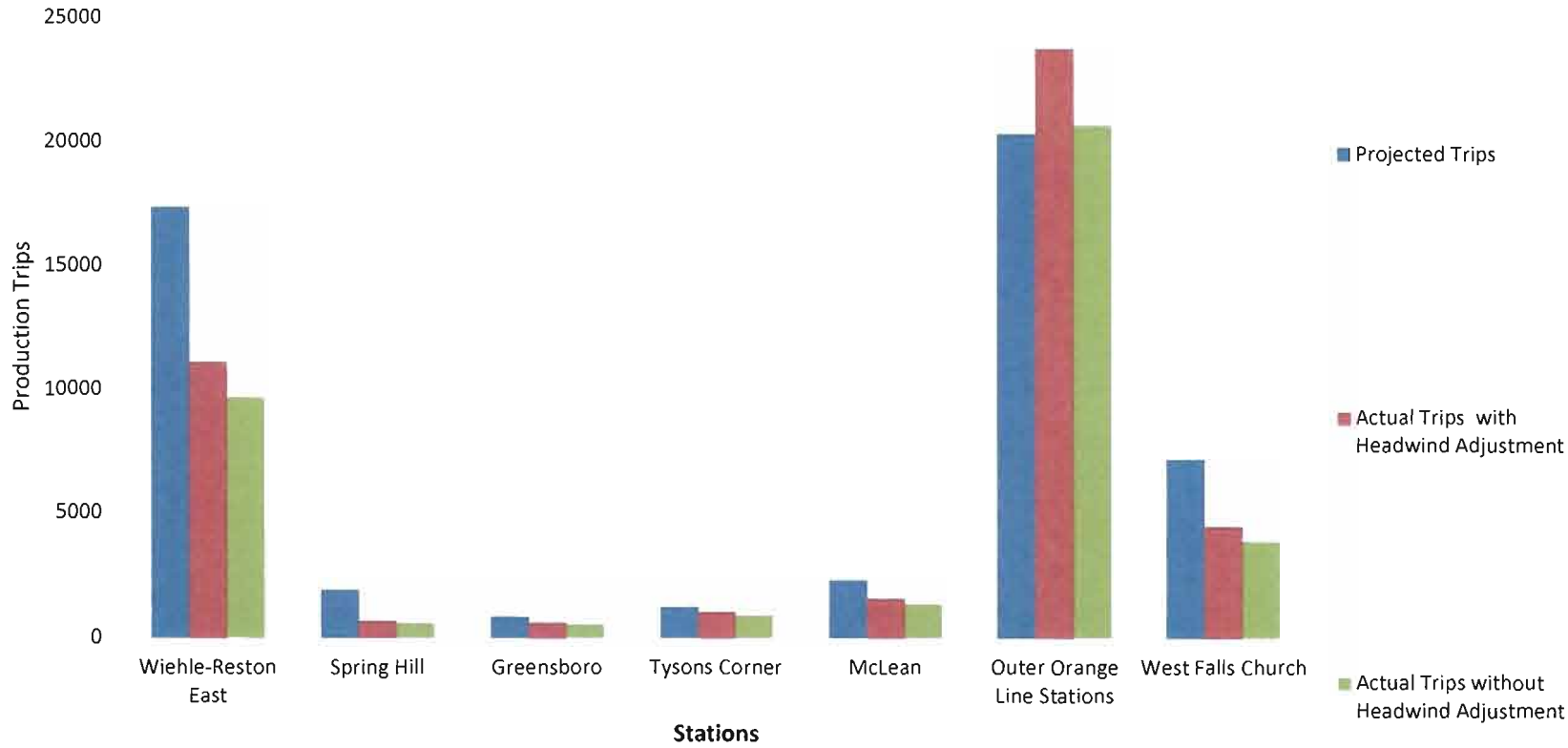


Figure A12: Comparison of Projected and Actual Attraction Trips – Home-Based Work Trips

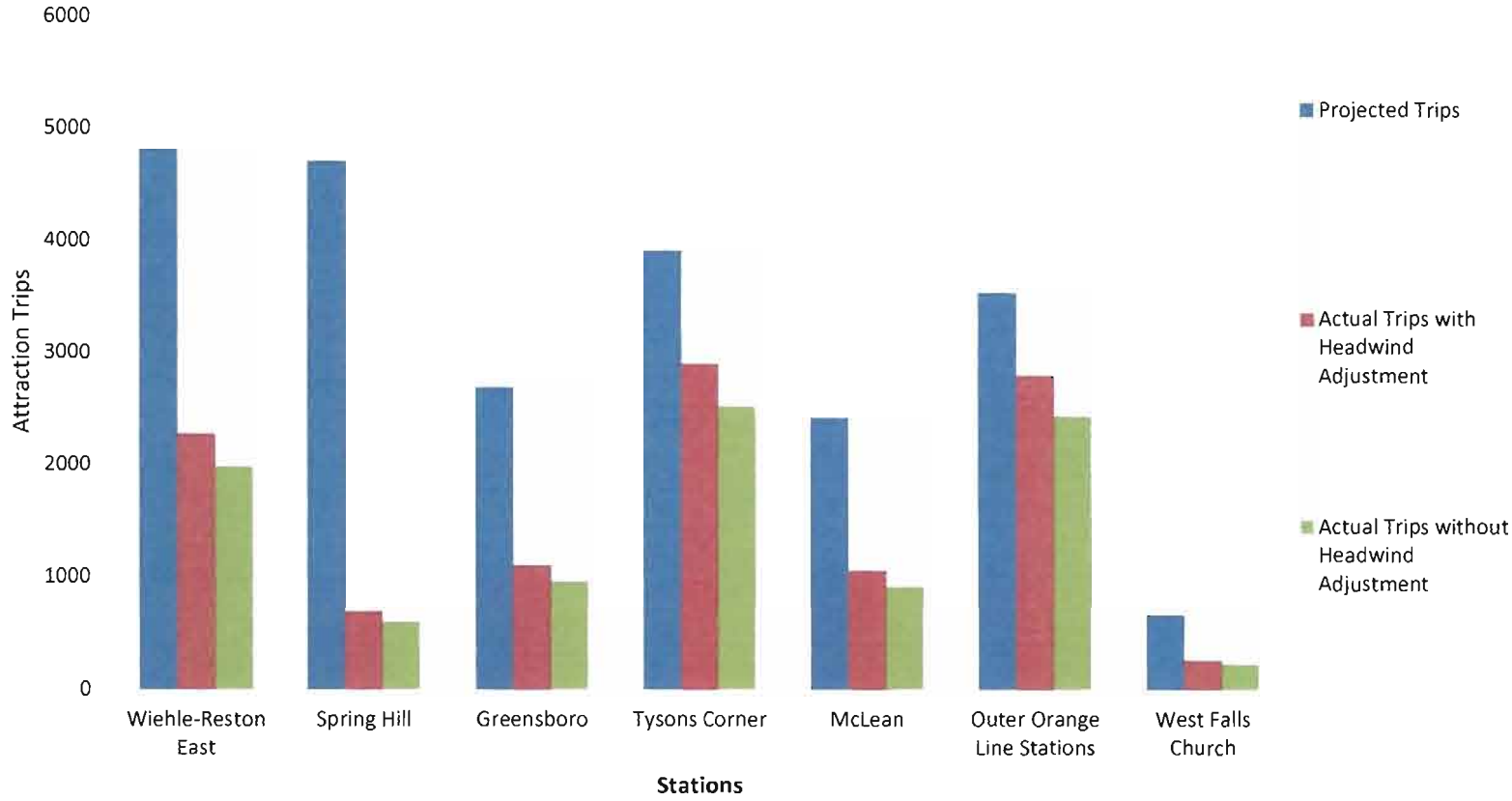


Figure A13: Comparison of Projected and Actual Production Trips – Home-Based Other Trips

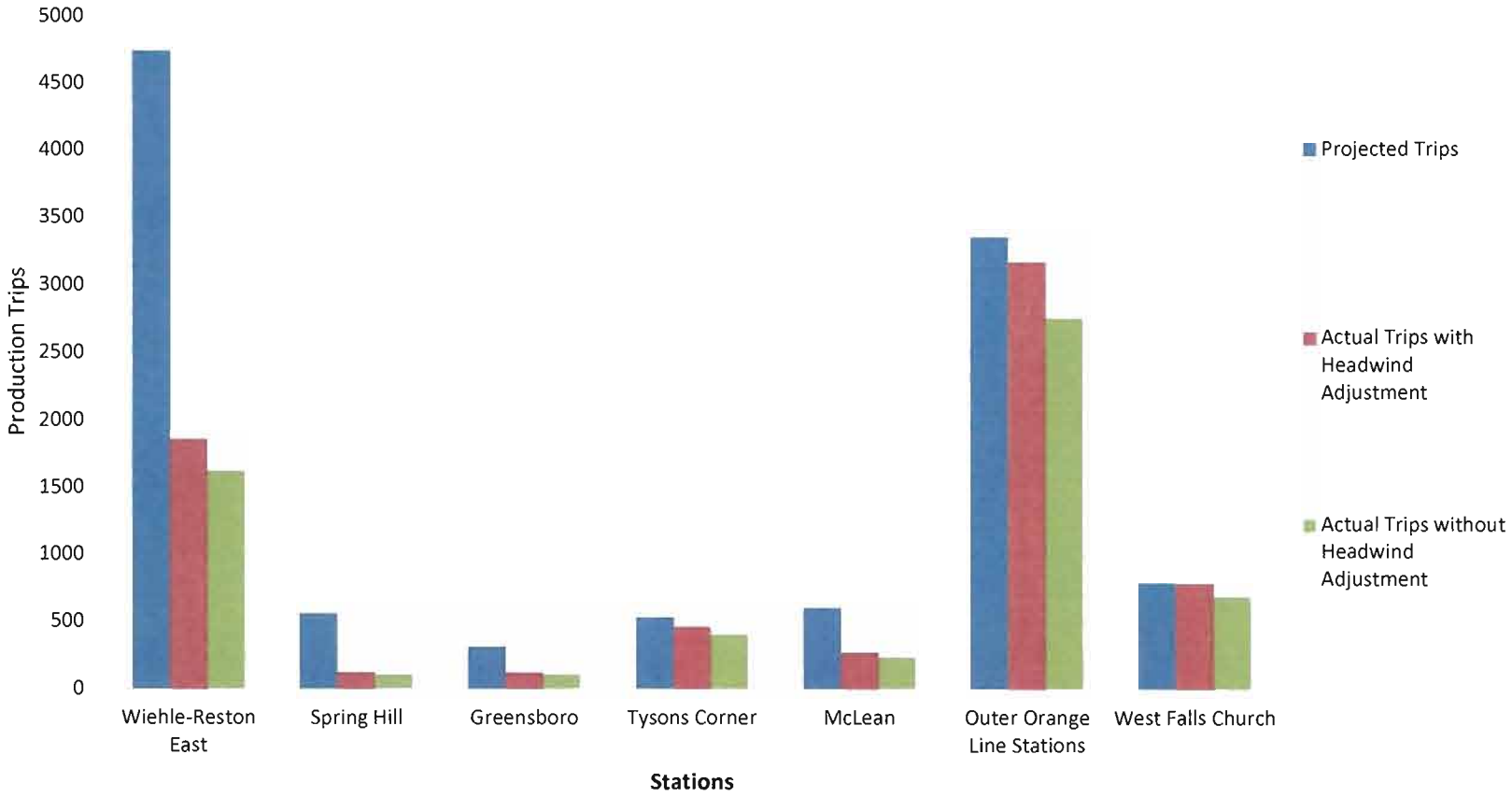


Figure A14: Comparison of Projected and Actual Attraction Trips – Home-Based Other Trips

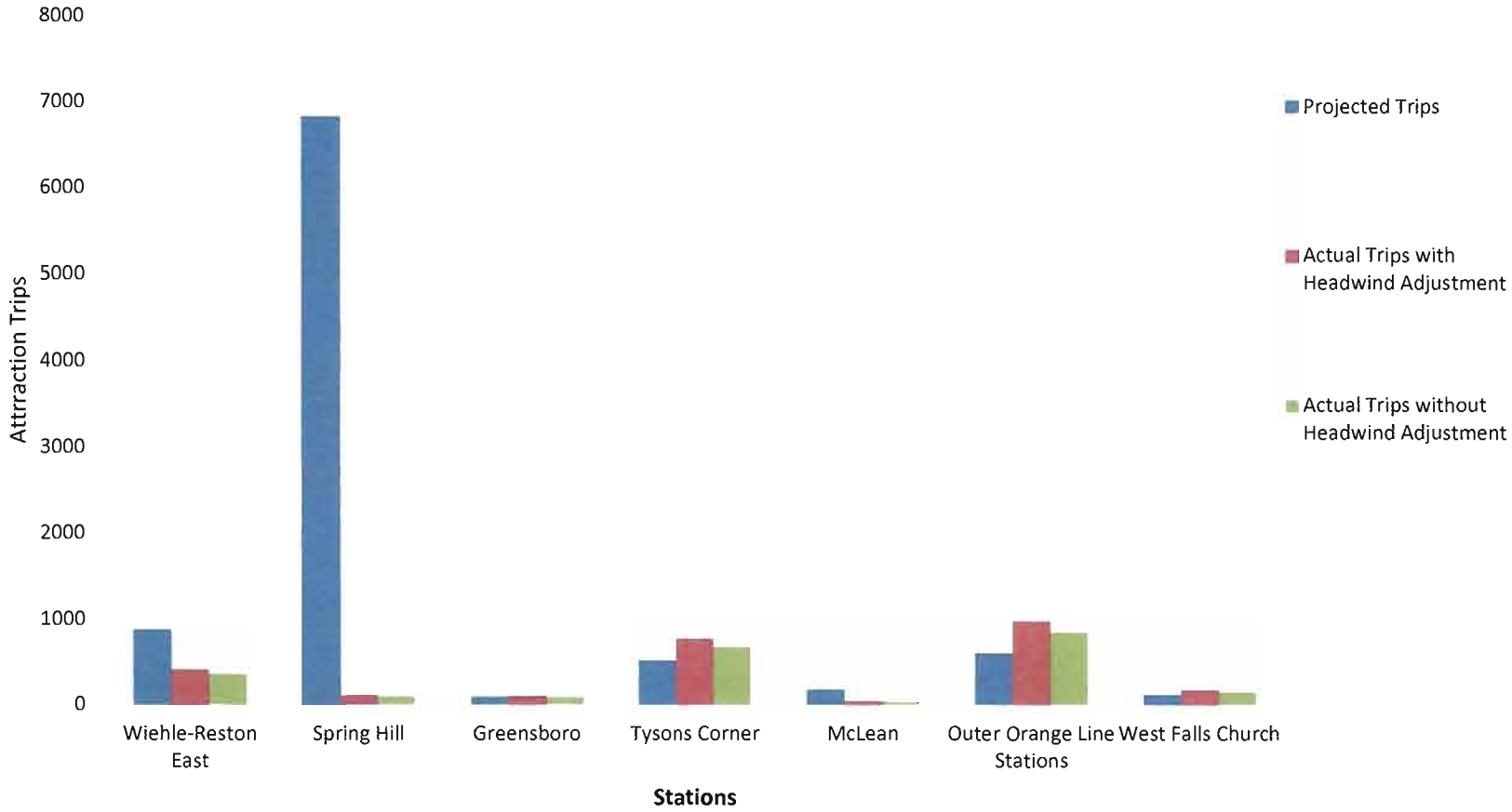


Figure A15: Comparison of Projected and Actual Production Trips – Non-Home-Based Trips

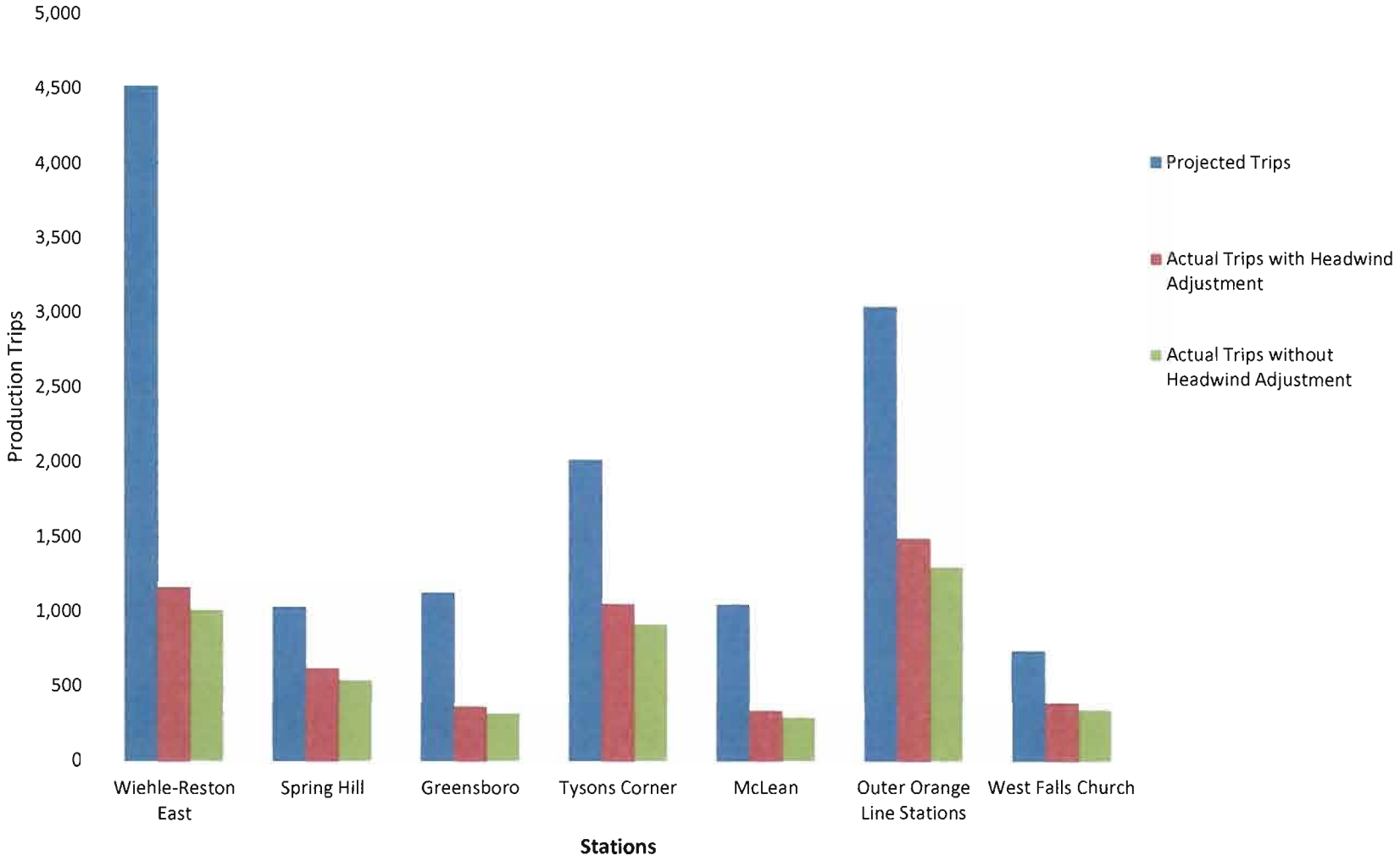
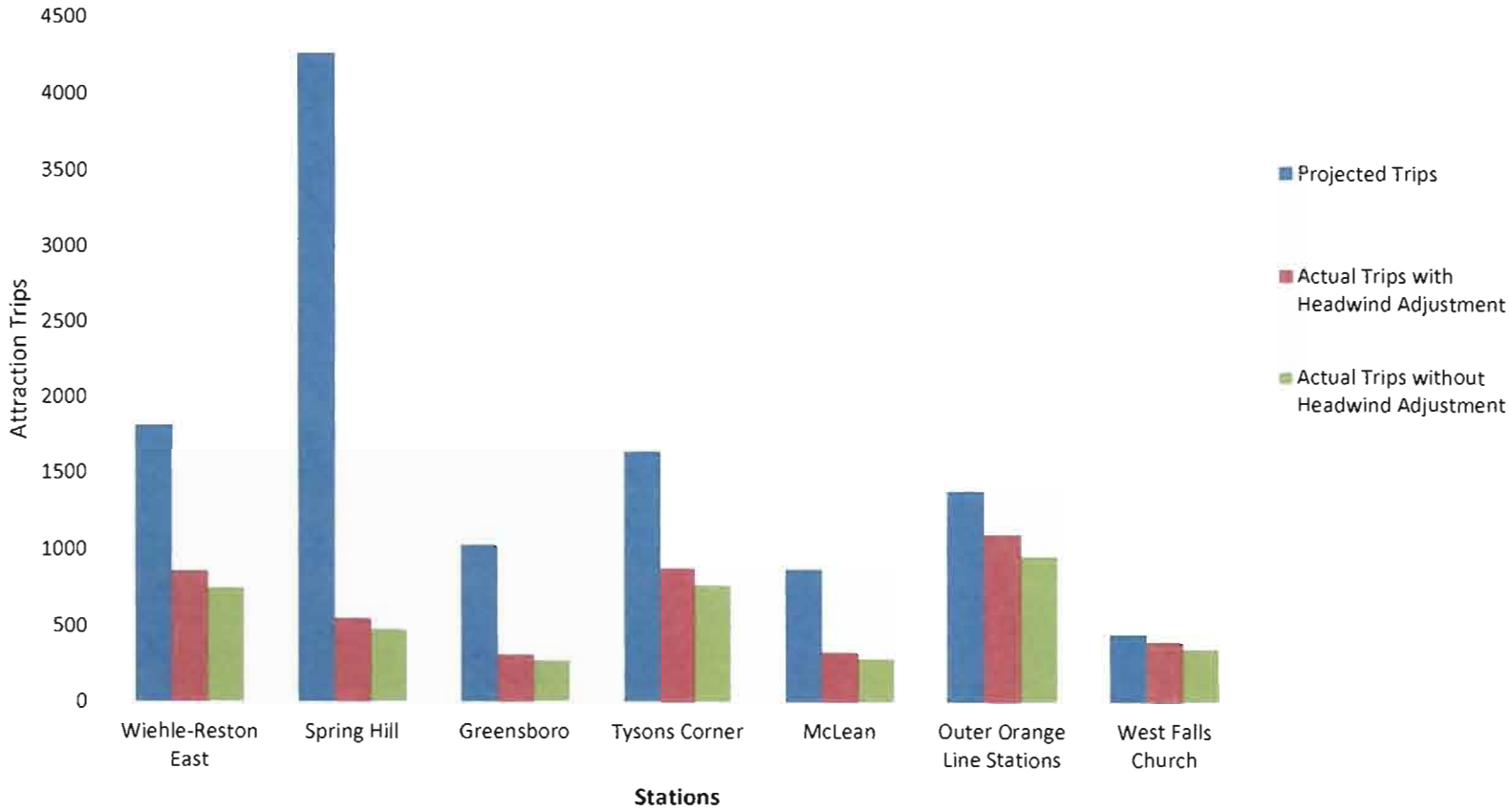


Figure A16: Comparison of Projected and Actual Attraction Trips - Non-Home-Based Trips



A5.7 Additional Mode of Access Comparison

A5.7.1 Bus-to-Rail Transfers

In the before project conditions, many transit riders in the Project corridor used buses to access Orange Line stations. To determine how trip patterns for these riders changed with the Project, bus-to-rail transfers at Metrorail stations in the Project area were compared between before and after conditions. SmarTrip transaction data was aggregated by bus operator and Metrorail station of access and is summarized in Table 95 for before and after conditions. The most notable trend is the large decrease in bus and rail transfers at West Falls Church. This is consistent with the trend of riders who previously took a bus to West Falls Church to access the Metrorail system and now access the system at a Silver Line station closer to their residence. Bus operators also changed their service plans to reduce service to West Falls Church and add service to Silver Line stations.

The bus intercept survey conducted for the after study surveyed passengers transferring between buses and Silver Line stations; questions in this survey included origin and destination information. Figure 17 shows the zip code of the trip destinations of survey respondents, which included passengers transferring between bus and Metrorail. The primary destinations of respondents were Tysons Corner, Arlington, and the system core in Washington, D.C.

In looking as specific routes, a sharp decrease in bus-to-rail transfers was observed on Fairfax Connector (FFC) buses between before and after conditions – a drop from 6,600 to 3,600 daily bus-to-rail transfers. This was largely due to the large reduction in bus routes feeding the West Falls Church station. These routes were replaced by FFC routes serving the Wiehle and Tysons stations.

Loudoun County saw a large increase in bus-to-rail transfers relative to before conditions; approximately 800 bus-to-rail transfers per day were observed, compared to 250 in before conditions.

Multiple FFC routes were re-routed to serve Wiehle-Reston East instead of West Falls Church (505, 551, 553, 557, 585, 950, 951, 952, 980). The collective ridership on these routes declined by 46%. The decline in ridership is likely due to multiple factors:

- These routes serve various park & ride locations throughout Reston; these riders were previously parking & riding to West Falls Church, but with the new Wiehle station (and for some, the Tysons Stations) being significantly closer to their trip origin, these park & riders can reduce their travel time by parking at Wiehle and make a direct transfer to Metro.
- Truncating these routes at Wiehle, instead of continuing service to West Falls Church reduces the capture area of these routes.
- Park & riders may have previously been motivated to park & ride to avoid paying to use the Toll Road; this motivation is eliminated with the proximity of the Wiehle and (to a lesser extent) Tysons stations.

- Riders are finding other non-bus means to access the Wiehle station due to its closer proximity (kiss & ride).

The route that saw the largest decrease in ridership was FFC route 505, which saw an 83% decrease in daily ridership from 27,000 daily riders before the Silver Line. This route previously served the Reston Town Center Transit Station and the Sunset Hills Park & Ride and terminated at West Falls Church Station. The route's new termini are the Reston Town Center Transit Station and the Wiehle Reston East Station, resulting in a 1.5-mile long alignment. It is likely that former park & riders on this route have opted to park & ride or be dropped off at Wiehle station instead. Intercept survey results on this route show that 71% of respondents using this route in before conditions accessed the bus by car, compared to only 15% of respondents in after conditions.

In examining airport-related travel patterns, approximately 60 daily production-attraction trips occur between Dulles Airport and Wiehle Station. It should be noted that this is an estimated based on the weighting of a very small survey sample size of approximately 15 people.

A5.7.2 Parking Access

Based on SmarTrip transaction logs, parking entrances by hour at the four outer Orange Line stations and the Wiehle station (the only Silver Line station with parking) are shown in Figure 18. Note that this only reflects parking entrances paid via SmarTrip (pay via credit card is also available), thus this does not represent total parking access volumes. In all scenarios, 7:00 AM was the busiest hour for parking entrances. The decrease in Orange Line parking entrances can be attributed to decreases in ridership caused by systemwide ridership decreases and trips shifting from the Orange Line to the Silver Line.

Table A95: Change in Daily Bus to Rail Transfers at Outer Orange Line and Silver Line Stations

Operator		Year	Vienna	Dunn Loring	West Falls Church	East Falls Church	McLean	Tysons Corner	Greensboro	Spring Hill	Wiehle-Reston East	Total
Arlington	ART	*2012*	0	0	0	50						**50**
		2016	0	0	0	122		Does not serve any Silver Line Stations				**122**
		Δ	0	0	0	72	-	-	-	-	-	**72**
CUE	CUE	*2012*	449	0	0	0						**449**
		2016	293	0	0	0		Does not serve any Silver Line Stations				**293**
		Δ	-156	0	0	0	-	-	-	-	-	**-156**
Fairfax Connector	FFC	*2012*	2041	272	4303	0						**6,616**
		2016	1,300	182	6	0	51	329	0	116	1,619	**3,603**
		Δ	-741	-90	-4,297	0	51	329	0	116	1,619	**-3,013**
PRTC	PRTC	*2012*	35	0	234	0						**269**
		2016	Does not serve any outer Orange Line Stations				0	137	1	1	0	**139**
		Δ	-35	0	-234	0	0	137	1	1	0	**-130**
WMATA	WMATA	*2012*	175	270	539	478						**1,462**
		2016	196	192	271	519	39	98	2	1	0	**1,318**
		Δ	21	-78	-268	41	39	98	2	1	0	**-144**
Loudoun County	LOUD	*2012*	0	0	244	0						**244**
		2016	0	0	145	0	0	0	0	0	631	**776**
		Δ	0	0	-99	0	0	0	0	0	631	**532**
Total		***2012***	**2,700**	**542**	**5,320**	**528**	**0**	**0**	**0**	**0**	**0**	**9,090**
		2016	**1,789**	**374**	**422**	**641**	**90**	**564**	**3**	**118**	**2,250**	**6,251**
		Δ	**-911**	**-168**	**-4,898**	**113**	**90**	**564**	**3**	**118**	**2,250**	**-2,839**

1. Does not include transfer activity for non-express local routes to Wiehle-Reston East station.

Figure A17: Comparison of Projected and Actual Attraction Trips - Non-Home-Based Trips

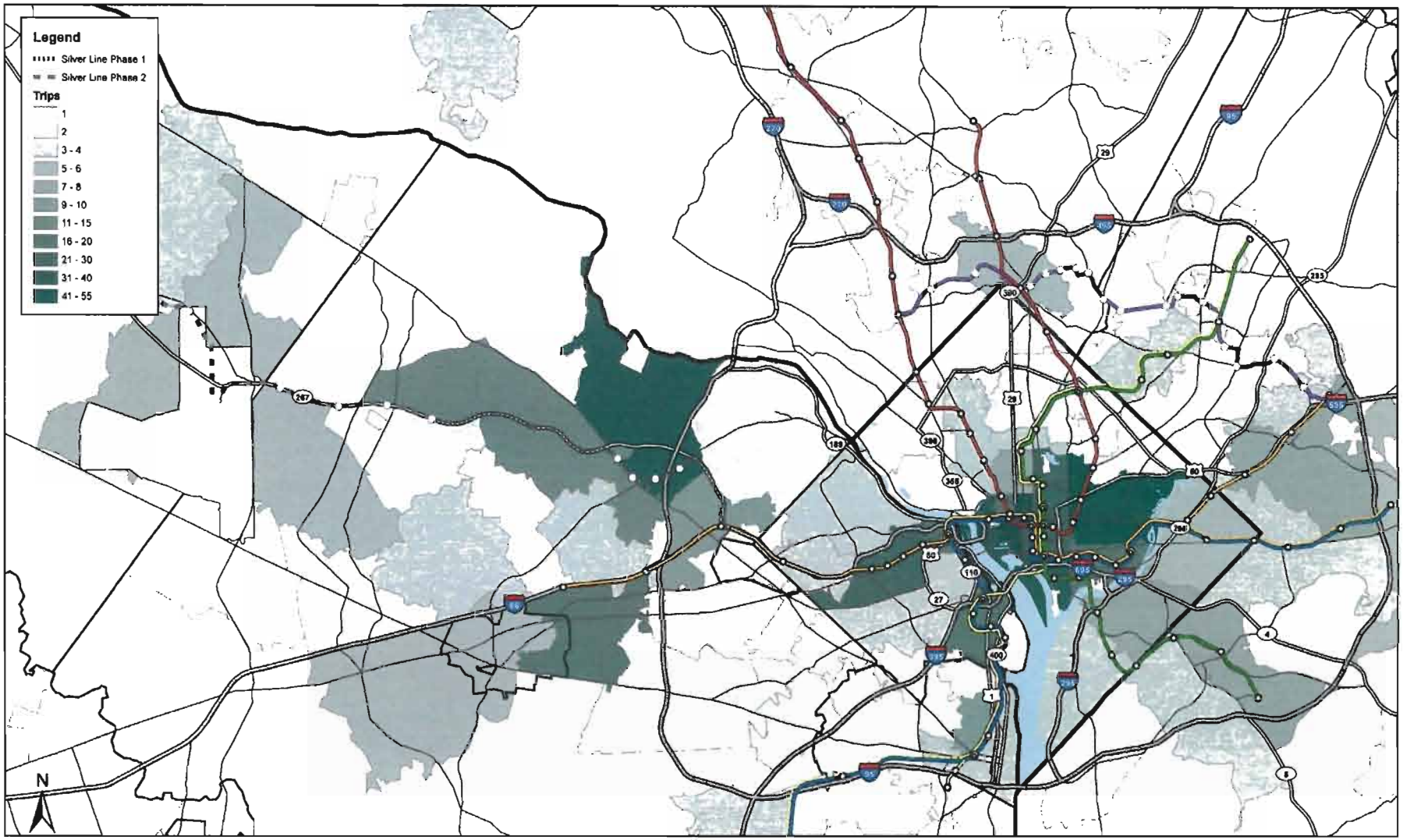
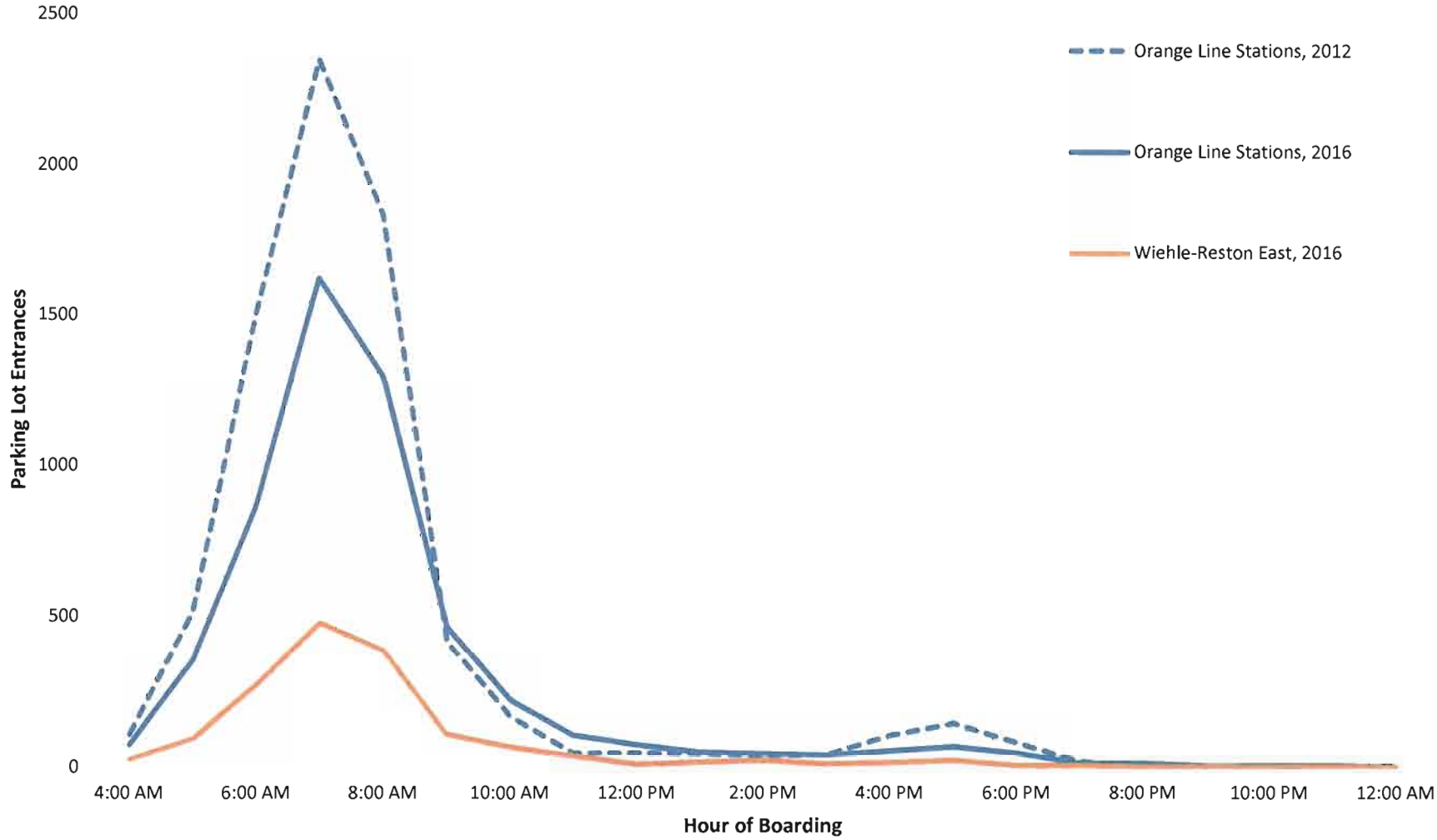


Figure A18: Change in Parking Entrances at Outer Orange Line Stations and Silver Line Stations, by Hour



A6. OTHER IMPACTS

DULLES CORRIDOR METRORAIL PROJECT

ELECTRONIC DOCUMENT CONTROL OUTGOING MAIL DISTRIBUTION SHEET

FOR ORIGINATOR COMPLETION:

EDC DATE STAMP

RECEIVED/SCANNED
DEC 20 2018
MWAA / PMSS
DOCUMENT CONTROL

DC TECH

TV

DATE:	117-18
SUBJECT:	LTR MWAA-10701 TO FTA RE BEFORE AND AFTER STUDY, TASK 5 COMPARATIVE ANALYSIS
DOC TYPE NO.:	MWAA-10701
WBS:	
FILE INDEX:	N/A
ORIGINATOR ADDRESS:	MWAA / PMSS , 198 VAN BUREN STREET, SUITE 300, HERNDON, VA 20170
ORIGINATOR, EMAIL AND TELEPHONE:	VAN ZEE

SPECIAL INSTRUCTIONS FROM ORIGINATOR:

TOTAL PAGES SENT TO RECIPIENTS (INCLUDING THIS SHEET):

☐ CONFIDENTIAL?

☐ OVERSIZED? (MORE THAN 11" X 17")

DISTRIBUTION

NAME(S)		DEPARTMENT / COMPANY	DISTRIBUTION DETAILS (FAX NO., EMAIL ADDRESS, BUILDING LOCATION, ETC.)	ORIGINAL	FYI COPY	(# OF COPIES)	SEND VIA: EMAIL	INTEROFFICE (HARD COPY)	U.S. MAIL	FEDEX NXT DAY	FEDEX 2ND DAY	FEDEX GROUND	MWAA COURIER	COURIER	FAX	OTHER
TERRY GARCIA CREWS		FTA		X			X			X						
A. ANDERSON		FTA					X									
J. RYAN		FTA					X									
J. ROUXE		FTA					X									
T. CRONE		MWAA					X									
J. VAN ZEE		MWAA					X									
P. ELMAN		PMSS					X									
P. HARRIS		PMSS					X									
M. LATHAM		PMSS					X									

ORIGINATOR SIGN:

APPROVED BY: VAN ZEE

APPROVED BY:

DELIVERY / SHIPPING ADDRESS OUTSIDE OF PMSS:

SPECIAL HANDLING AND/OR REMARKS: PHASE 1 X PHASE 2 ☐